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ABSTRACT

This Technology Learning Activity (TLA) for agriculture education in grades 6-10 is designed to help students learn the basic terminology of a farm system while they experience the responsibility of keeping a profitable farm in operation through use of the interactive SimFarm software. Introductory materials provide an overview of technology education and information on using the two parts of the TLA: the instructor's guide and the student guide. The instructor's section provides the following: an overview of technology education, a list of high priority academic student skills specific to the TLA, a summary of activities and supplies needed for students to complete the TLA, a resource list, an instructional sequence (daily lesson plans with suggested daily assignments; equipment, tools, and supplies needed for each student; and facility requirements or modifications), a supplies and materials worksheet, pretest and posttest, written exam answer sheets, and evaluation summary for the TLA. The student's section provides daily activities for each of the 8 days. Within the daily activity pages are these components common to all TLAs: summary of activities, pretest instructions, list of assignments to turn in, goal, glossary, list of priority academic students skills reinforced by this TLA, list of objectives, related Technology Student Association competitive event(s), and academic and workplace applications. (YLB)

ED 383 934

Technology Learning Activity

AGRICULTURE EDUCATION SIMFARM™

TLA TE-1123

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CIMC

Teacher Edition

Oklahoma Department of Vocational and Technical Education
1500 West Seventh Avenue
Stillwater, OK 74074-4364

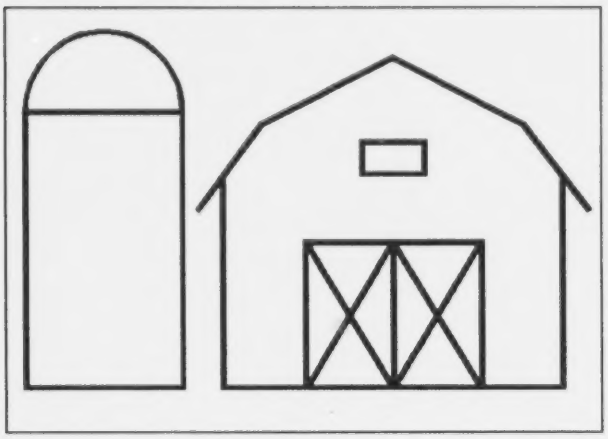
TECHNOLOGY EDUCATION

TECHNOLOGY LEARNING ACTIVITY

TE1123

AGRICULTURE EDUCATION
SIMFARM™

Suggested Time: 8 Days



Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

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Curriculum and Instructional Materials Center

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FOREWORD

What will be the careers of the future? The workforce of tomorrow will be shaped by the technologies being developed today. Students today need accurate, interesting information on growing technologies in order to make informed decisions about their futures.

It is our hope that this curriculum will help improve the quality of career decisions for our students. Students are introduced to a wide range of current, "cutting-edge" technologies and are encouraged to think critically about how those technologies influence their lives and futures. Today's students do not have to become the victims of "technological illiteracy," but instead can learn to anticipate technological developments and take positive steps to prepare for the future.

Technology Learning Activities provide students with the knowledge and an introduction to the skills they need for a positive learning and career experience. Every generation is faced with learning how to manage technological advances. Information gained through participation in the Technology Education program can help students develop a holistic view of technology on which to base their educational and career decisions.

Roy Peters, Jr., Ed.D., State Director
Oklahoma Department of
Vocational and Technical Education

Lynn Hawkins, State Supervisor
Technology Education
Oklahoma Department of
Vocational and Technical Education

PREFACE

We believe that one of the most effective ways to improve education is through the development and implementation of a sound instructional materials system. Technology Education instructional materials represent a new design for CIMC which recognizes the importance of graphic materials in the learning process.

Technology Education instructional materials are designed for 6th through 10th grade students. The design of these materials is based on current research on how people read and gain information from documents. The design is called "New Look" and integrates both graphics and text into a balanced presentation which is easy to use and follow.

Technology Education provides the student a look at what the world will be like in the future based on technologies in use and being developed today. Throughout the Technology Education instructional materials, the students are introduced to "cutting-edge" technologies that they will use and encounter in a working environment later in life. This exposure gives them a wide range of experiences on which to base career decisions.

This publication is intended as a starting point, from which the teacher can innovate, localize, and personalize in order to prepare students for their future. The Technology Education series of Technology Learning Activities was written with the realization that we are creating the workforce of tomorrow by how and what we teach about technology today.

Ann Wolfe, Instructional Design Specialist
Curriculum and Instructional Materials Center
Oklahoma Department of
Vocational and Technical Education

ACKNOWLEDGEMENTS

The Curriculum and Instructional Materials Center (CIMC) extends its appreciation to those individuals who played important roles in the development of Technology Learning Activity materials.

Generous thanks is extended to Rocky Shepherd, a Technology Education teacher at Weatherford Middle School for the time, talent and knowledge he contributed in the writing of this Technology Learning Activity (TLA).

Thanks is also extended to Lynn Hawkins, formerly a Technology Education teacher and currently State Supervisor, and Jim Harder, a Technology Education teacher at Mayfield Junior High School, for the time, talent and knowledge they contributed in determining the content of this Technology Learning Activity (TLA).

We also thank the State Director, Dr. Roy Peters, Jr., and the Assistant State Director, Dr. Charles O. Hopkins, for their continued support throughout this project.

Oklahoma Department of Vocational and Technical Education Technology Education staff who provided leadership and direction on this project also deserve special recognition.

Lynn Hawkins
State Supervisor
Technology Education

Donovan Bowers
Assistant State Supervisor
Technology Education

Harold Holley
Assistant State Supervisor
Technology Education

Only through the close cooperation of the Curriculum and Instructional Materials Center staff was this curriculum developed. Sincere thanks are shared with the CIMC coordinators.

John Friedemann
CIMC Coordinator

Lynna Ausburn, Ph.D.
CIMC Development Coordinator

Special recognition and thanks are also extended to other individuals within the Oklahoma Department of Vocational and Technical Education (ODVTE) involved in the development and distribution process: Danny Darrow and Diane Ensign and their staffs at the ODVTE Print Shop; Bob Davis and staff artist Kathryn Moore for the cover design; Darrell Stiles and his staff in the ODVTE Warehouse for packaging and coordinating transportation and distribution of these materials.

Finally, a big thank you to all ODVTE team members who offer their support on a daily basis in "behind-the-scenes" ways but never seem to be recognized for their contributions: Suzanne Perry and Terri Tomson, CIMC secretaries; Shirley Hill and Beverly Mealer, Technology Education secretaries.

TECHNOLOGY EDUCATION OVERVIEW

About the Program

Because the American culture is distinctly characterized as technological, it becomes the function of our schools to give every student an insight into and an understanding of the technological nature of the culture. Technology Education strives to perform this function.

Technology Education in Oklahoma is an instructional program that provides young men and women (grades 6-10) with daily, hands-on exploratory experiences and insights into technology and career opportunities so that they can make meaningful occupational and educational choices. It is a program which can enhance the educational experience of all students, whether they are the valedictorian/honor-type student, the middle range/average student, or the student who has found little success in school, namely the at-risk student.

Technology Education acquaints all students with their technological environment so they can make rational decisions about their own lives on a day-to-day basis and participate in controlling their own destiny. The program directs students to related technological and industrial fields, enabling students to realize their full potential and make maximum use of their individual talents in fulfilling career goals in their selected areas of employment.

Technology education capitalizes on the individual's potential for reasoning and problem solving, for imagining and creating, and for constructing and expressing through the use of tools and materials related to technology. It develops content and experiences to contribute to the growth and development of students commensurate with their potential. Thus, Technology Education is a basic and fundamental study for all persons in regard to career explorations and educational opportunities.

TECHNOLOGY EDUCATION OVERVIEW

Opportunities to develop and apply leadership, social, civic, and technologically related skills are provided through the Technology Student Association (TSA). TSA is the appropriate vocational student organization identified as a teaching tool for teachers to use in assisting students to achieve identified course competencies. Competency-based activities are an integral part of the instructional program.

All Technology Education courses are taught in a one-period block of time (45-55 minutes), with each of the four Technology systems (communication, construction, manufacturing, and transportation, energy and power) being designed to provide a means through which other courses such as math, science, English, and social studies can be applied in a practical manner within a technology-based situation. Teaching across the curriculum is vital to the success of a Technology Education program.

TECHNOLOGY EDUCATION OVERVIEW

About the TLAs

The Technology Education series consists of 40 Technology Learning Activities (TLAs) for instruction and a supplemental activities book. Each TLA is divided into two parts: an instructor's guide and a student guide. The instructor's guide provides an overview of Technology Education, a summary of activities and supplies needed for students to complete the Technology Learning Activity, a supplies and materials worksheet for the instructor, an overview of the particular TLA, written exam answer sheets, and evaluation summary for the TLA.

Master copies of the evaluation summary sheets, pretest and posttest, and supplies and materials worksheets are provided with this instructors edition of the TLA. These sheets may be reproduced for classroom use.

All of the TLAs focus on measurable and observable learning outcomes. Instructors are encouraged to supplement, personalize, localize, and motivate with these materials in order to develop a complete teaching/learning process.

TLAs are designed for use in more than one class period of instruction. Careful study of each TLA by the instructor will help her or him determine the following:

- >>> Skills to demonstrate
- >>> Supplies and equipment needed
- >>> Amount of time needed for student practice
- >>> Workstation Bookshelf, Instructors Reference Materials, and a bibliography are provided for supplemental resources
- >>> Supplementary materials, including print and non-print media to order
- >>> Resource people to contact
- >>> Facility modifications which may be necessary to administer the TLA

TECHNOLOGY EDUCATION OVERVIEW

Each TLA is based on performance objectives. Performance objectives are specific, stating the performances necessary to meet the goal of the TLA.

The overall goal of the unit tells what the student should be able to do and what standard will be used to determine whether the student has achieved competency. The specific objectives outline the sequence of the competencies required to meet the TLA goal. The competencies may be either cognitive, requiring knowledge only, or psychomotor, requiring knowledge and skill.

TECHNOLOGY EDUCATION OVERVIEW

About Ordering TLAs

Additional TLAs in the Technology Education series may be ordered through the Oklahoma State Department of Vocational and Technical Education, Curriculum and Instructional Materials Center, 1500 West Seventh Avenue, Stillwater, OK 74074-4364. Phone 1-800-522-5810.

☑**NOTE:** Instructor's Editions have order numbers in the 1100 series (for 8-Day TLAs) and 1200 series (for 6-Week TLAs). Student Editions have numbers in the 3100 series (for 8-Day TLAs) or 3200 series (for 6-Week TLAs).

Corrections and Suggestions

CIMC wants to provide Technology Education instructors and students materials that are accurate and effective. Although the CIMC strives to maintain the highest standards of development and production, oversights occasionally do occur. If you find any errors in this or other CIMC publications or have suggestions for improving their usefulness, please notify the CIMC staff. One easy way of pointing out errors is to make a photocopy of the affected page and indicate the correction on the copy. Mail this information to the CIMC, where it will be used to correct the publication before the materials are reprinted.

To ensure that the material is updated on a timely basis, notify the CIMC of necessary corrections as soon as possible. Do not assume that someone else will notice the error and inform the CIMC; other users may be making the same assumption. Please send corrections and recommendations for improving this publication to the following address:

Curriculum Development Coordinator
Curriculum and Instructional Materials Center
Oklahoma Department of Vocational and Technical Education
1500 West Seventh Avenue
Stillwater, Oklahoma 74074-4364

USING THIS PUBLICATION

INSTRUCTOR'S SECTION

Background Information

The background information component provides instructors with basic information about the subject of the TLA. Instructors are encouraged to use suggested resources for additional information on the specific technology used in each TLA.

Priority Academic Student Skills

There are 14 Priority Academic Student Skills for the Technology Education series. Not every TLA fulfills all 14 Priority Academic Student Skills, so outcomes specific to each TLA are listed in the Instructors Section and in the Students Section. The 14 Priority Academic Student Skills for the Technology Education series are:

- The student will know and appreciate the importance of technology and technological literacy.
- The student will explore career opportunities so they can make meaningful occupational choices.
- The student will explore future educational opportunities so they can make meaningful educational choices.
- The student will apply problem solving and critical thinking techniques.
- The student will apply math, science, reading, and other school subjects in a practical situation.
- The student will develop keyboarding and computer literacy skills.
- The student will develop basic skills in the safe and proper use of tools, machines, materials, processes, and technical concepts.
- The student will think logically and sequentially.
- The student will develop leadership, creative abilities, positive self-concepts, and individual potential in a technological society.
- The student will develop an understanding and the ability to adapt to those technological forces that influence life in the 21st Century.

USING THIS PUBLICATION

INSTRUCTOR'S SECTION

- The student will develop an understanding of economic development.
- The student will communicate by making clear and relevant points through the development of mental process skills.
- The student will apply design, imagination, and creative abilities.
- The student will explore the organization and management systems of business and industry.

Suggested Activities

The suggested activities component is designed to assist during the preparation stage of the teaching/learning process. The activities provide suggestions for preparation and evaluation during the instructional process. The instructor should read the suggested activities before assigning the TLAs to allow time to obtain supplemental materials, prepare audiovisual materials, and contact outside resource persons. Duties of the instructor will vary according to the particular TLA.

Suggested Resources

Suggested resources, include people, as well as print and non-print media that may be used with the TLA. References used during the development of each TLA are also provided. The instructor can use suggested resources and TLA references to supplement her or his knowledge of the subject to help students with particular interests or objectives in the area covered. Please note that suggested resources and references listed in this publication existed when this publication was written. CIMC assumes no responsibility for providing these materials and cannot ensure the availability of these materials as individual vendors, manufacturers, and publishers may discontinue these products at any time.

USING THIS PUBLICATION	INSTRUCTOR'S SECTION
Instructional Sequence	This component provides instructors with daily lesson plans for the TLA. Included in the instructional sequence component are suggested daily assignments and equipment, tools, and supplies that will be needed for each student. A column for facility requirements or modifications is provided for each instructor. This component is provided as a guide to plan for and monitor students' progress through the TLA.
Equipment, Tools, and Supplies: Summary Worksheet	This component is provided as a planning tool for instructors. It provides instructors with a list of the necessary equipment, tools and supplies to support student activities and provides specific information for budgeting purposes.
Pretest and Posttest	These components provide criterion-referenced evaluation of the objectives listed in each TLA. If objectives or activities have been added, deleted, or modified, appropriate changes should be made on the tests.
Test Answers	This component is provided to assist instructors in evaluating student performance on written tests.
Evaluation Summary	This component is provided to assist instructors in summarizing the performance of each student on an individual basis. The evaluation summary forms are also provided as photocopy masters for the instructors use.

USING THIS PUBLICATION

STUDENT'S SECTION

Introduction

Daily activities are the step-by-step procedures students will follow to complete the learning experience. Each TLA is organized by daily tasks and activities. Students are able to pace their progress through the TLA by referring to the activities for the day.

Within the daily activity pages are components common to all TLAs.

Summary of Activities

A Summary of Activities page begins each day of the TLA. This page provides several important pieces of information for both the student and instructor.

1. In the left column this page provides the student with a list of activities to be accomplished that day.
2. In the right column the major Academic and Workplace Application which applies to that day's activities is graphically indicated with a standard icon.
3. Below the icon is a list of specific skills reinforced during that day's activities.

Pretest Instructions

The students are required to take a Pretest as one of the first day's activities. The instructions for the Pretest are given in this section.

Assignments to Turn In

Day One includes a list of all assignments the students are expected to turn in during or at completion of the TLA. This list includes all tests, activities, and products covered in the TLA.

Goal

On Day One, following the assignments checklist, is a concise statement of the overall goal of the TLA. This statement summarizes the purpose for completing the TLA and encourages the student to think about the broader implications of the learning experience.

USING THIS PUBLICATION	STUDENT'S SECTION
Words You Should Know	The first day's activities includes a glossary of unfamiliar technical terms used in the TLA. Often these terms are necessary for the student in order to accurately follow instructions in the activity procedures. The students should be encouraged to review this glossary and refer to it often during the course of the TLA.
Priority Academic Student Skills Reinforced by this TLA	As stated in the guide to the Instructor's Section, there are 14 identified Priority Academic Student Skills associated with the Technology Education series. This section of Day One activities lists the Priority Academic Student Skills that specifically apply to the TLA. A student who reviews this list will gain a better understanding of the scope of experiences and skills to be gained from the TLA.
Objectives	Each TLA is made up of a set of measurable objectives. In this section on Day One, students are given a list of all the objectives addressed in the TLA. This list can serve to introduce students to the flow of the TLA as they build introductory skills in a technology.
Related TSA Competitive Event(s)	Each TLA may be used by students to begin work toward completion of a Technology Student Association competitive event. Some TLAs are tied to a specific TSA event; other TLAs may be used with several events. This Day One section gives the student and instructor a list of appropriate TSA events which the TLA may support. TSA competitive events promote leadership development, and an understanding that winning isn't everything but involvement is. Events are staged at Local, Regional, State, and National levels.

USING THIS PUBLICATION

STUDENT'S SECTION

Academic and Workplace Applications

The curricular content and activities found in this Technology Learning Activity help students apply academic and workplace competencies. These competencies include: Reading Skills, Writing Skills, Mathematics Skills, Science Skills, Oral Communications Skills, Interpersonal or Relating Skills, Creative Thinking and Problem Solving Skills, Employability Skills, and Social Studies Skills.

Preparing students to enter successfully into today' world . . .

Preparing students to enter successfully into today's world of work offers vocational education a substantial challenge. The contemporary workplace is characterized by constant and rapid technological change and by increasing job complexity and skill intensity. Due to rapid technological advancement, the half-life of work skills is now reduced to a bare three to five years. Out of this new workplace environment has arisen a growing national awareness of the critical importance of an American workforce armed with the skills necessary to survive in a competitive economy.

. . . emergence of a renewed emphasis on basic academic skills . . .

One result of this national awareness has been the emergence of a renewed emphasis on basic academic skills in all areas of education. Pressure to increase academic skill development is being placed on education by both legislative action and industry mandate. The Carl D. Perkins Vocational and Applied Technology Education Act of 1990 sets stringent academic and workplace skill requirements for vocational education. State legislatures are increasingly requiring basic skills accountability by teachers and school administrators.

. . . expected learner outcomes are being implemented with increasing frequency.

Graduation exams, minimum competency requirements, and expected learner outcomes are being implemented with increasing frequency. In addition, business and industry are delivering the message clearly to educators that vocational competence now requires increased strength in academic and workplace skills.

USING THIS PUBLICATION

STUDENT'S SECTION

The issue of basic skills . . . was successfully addressed in a national three-year study . . .

The issue of the basic skills currently required in the work place was very successfully addressed in a national three-year study conducted jointly by the American Society of Training and Development (ASTD) and the U.S. Department of Labor (DOL). The findings of this study were published in 1990 in the book, Workplace Basics: The Essential Skills Employers Want.

. . . research indicates clearly that American employers . . . need a variety of skills . . .

The ASTD/DOL research indicates clearly that American employers have discovered that their workforces need a variety of skills that include, but are not limited to, the classic academic trio of reading, writing, and computation. Employers now are also looking for competence in areas such as "learning to learn," problem solving and critical thinking, interpersonal and teamwork skills, oral communication and listening techniques, and the social and personal management skills that demonstrate a capacity for independence and responsibility in on-the-job performance.

. . . business and industry have expanded and redefined "workplace basics."

It is clear that the requirements of today's business and industry have expanded and re-defined "workplace basics." It is in line with this re-definition, and with the competency requirements of current education legislation, that the Oklahoma Department of Vocational and Technical Education has chosen to address "basic skills" in the instructional materials produced by its Curriculum and Instructional Materials Center.

CIMC materials contain information and activities which develop academic and workplace application competencies . . .

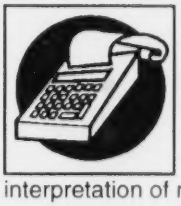
It is not a new development for CIMC materials to contain information and activities which develop academic and workplace application competencies in students undertaking vocational programs. What is new is the specific marking, or flagging, of items in our instructional materials that address academic and workplace application skills.

USING THIS PUBLICATION

To assist teachers and students in identifying activities which promote academic and workplace skills . . .

READING SKILLS: Skills involving use of print resource material for obtaining and applying information.

WRITING SKILLS: Skills involving written communication of processes, information, or ideas.



MATHEMATICS SKILLS: Skills involving computation, calculation, and interpretation of numerical data.

STUDENT'S SECTION

To assist teachers and students in identifying activities which promote academic and workplace skills development, CIMC has implemented a marking system which uses simple graphic symbols, or icons. These icons are located in the right margins of Activity Sheets. The following is an explanation of the icons and the kinds of academic and workplace application activities they indicate.

Current vocational education literature indicates that functional literacy as a workplace basic needs to be defined in terms of reading competencies actually required for job performance. The activities identified with this icon as addressing reading skills in CIMC materials deal specifically with developing reading skills in an applied, job-related context. These range from general information-gathering activities to tasks requiring use of specific technical reference materials. Many contain a "learning to learn" aspect, which promotes engaging actively and purposefully in vocationally relevant enquiry.

Tasks identified with this icon promote development of skills in written communications. As with reading skills, the writing skills emphasized in CIMC materials have a vocational context. They include filling out forms, keeping work activity records, writing simple memos and letters, generating more complex reports and articles, and written expression of ideas and concepts related to vocational performance or exploration.

This icon identifies activities which develop vocationally-related skills in computation, measurement and estimation, selection and application of appropriate mathematical processes, and collecting, displaying, or interpreting data.

USING THIS PUBLICATION

SCIENCE SKILLS: Skills involving mastery and application of scientific information or theory.

ORAL COMMUNICATION SKILLS: Skills involving speaking and listening.

INTERPERSONAL OR RELATING SKILLS: Skills involving working and getting along with others.

CREATIVE THINKING AND PROBLEM SOLVING SKILLS: Skills involving comprehending, applying, analyzing, and developing complex ideas and situations.

STUDENT'S SECTION

This icon marks activities which are related to the development of skills in either the physical or biological sciences. These skills stress occupationally-related applications of science and technology.

Activities marked with this icon promote development of effective speaking and listening. They include practice in such areas as speaking techniques, word choice, non-verbal messages, use of communication media, and using active listening techniques. Many of these activities promote "learning to learn" skills in verbal enquiry.

Activities which deal directly with skills in relating to others are marked with this icon. This includes areas such as multi-cultural awareness, group processes and dynamics, negotiation, dealing with conflict, cooperation and teamwork, values and attitudes, and leadership and motivation.

This icon identifies activities which stress development of higher-order thought processes such as problem identification and analysis, lateral thinking, evaluating alternatives, developing solutions, examining assumptions, and evaluating outcomes.

USING THIS PUBLICATION

EMPLOYABILITY SKILLS: Skills involving choosing, obtaining, and succeeding in a career.

SOCIAL STUDIES SKILLS: Skills involving investigation and application of social concepts.

STUDENT'S SECTION

Activities marked with this icon relate to competencies required to obtain employment and develop a career. These competencies include specific occupational tasks. They also include items such as career analysis and selection, job searching, completing applications and resumes, interviewing, and business etiquette and personal management skills required for job-keeping and maturing in one's work. Examples of the latter category include personal presentation, self-discipline, work accuracy, reliability, discretion, punctuality, stress handling, judgement, confidence, etc.

This icon marks activities which stress competencies in fields relating to human society and its distribution and relationships. This includes areas such as history, geography, government and politics, economics, psychology, sociology, demographics, current events, cross-cultural studies, consumer issues, environmental issues, and ethical concerns in science and technology.

USING THIS PUBLICATION

Impact Statements

STUDENT'S SECTION

There are five areas of human culture for which each TLA has an impact. These impact statements appear during Day Eight, after the student has gained some familiarity with the technology.

1. ENVIRONMENTAL IMPACT: A statement introducing the student to the impact of the technology on the environment.
2. SOCIAL/CULTURAL IMPACT: A statement concerning the impact of the technology on society and culture.
3. ECONOMIC IMPACT: A statement concerning the impact of the technology on the economy.
4. POLITICAL IMPACT: A statement concerning the impact of the technology on politics, laws, and regulations, and the impact of politics on the development of the technology.
5. ERGONOMIC IMPACT: A statement concerning the ergonomic implications of the technology. Ergonomics is the study of developing products and systems that meet peoples' needs.

Impact Statements offer the student the opportunity to see beyond the activities in the Technology Learning Lab and glimpse the real-world applications of the technology.

USING THIS PUBLICATION	STUDENT'S *SECTION*
Career Search	Also on Day Eight, the students are given the assignment of investigating several career opportunities related to the technology of the TLA. The investigation is done with Career Search Abstracts. A list of up to five careers related to the TLA is given, followed by pages from Career Search Abstracts that detail the career qualifications and work environment. The student is required to choose two of the five related careers, read the appropriate abstracts, then write a short essay about why those careers may be appealing.
Posttest Instructions	The students are required to take a Posttest as one of the last day's activities. The instructions for the Posttest are given in this section. The score for the Posttest may be compared to the score for the Pretest to help determine the student's gain during the TLA.
Skunk Works	Skunk Works, a Day Eight optional activity, includes instructions that could be used for solving problems or reinforcing the enrichment of learning. The term Skunk Works was coined by engineers at 3M Corporation in the mid-1960s. Some engineers wanted to develop a new product, but company management would not give them the time or money to work on the project. So the engineers "borrowed" time and money from approved projects to work on their "Skunk Works." When they finished developing the product, they presented it to management and it has been a 3M product ever since. The product: Velcro fasteners.

HAZARD ALERT MESSAGES

The Daily Activities include hazard alert information specific to the Activity. These messages should be discussed carefully and thoroughly. The Hazard Alert Message system used in the TLA is based on the American National Standards Institute (ANSI) Standard Z535, which provides for five levels of alert.

Students are introduced to the ANSI Hazard Alert Message system as an activity in the Laboratory Safety for Construction Technology TLA (TE1107/TE3107). This system was adopted by ANSI as the standard in 1990 and will be the hazard alert system in use when students reach the workplace.

Hazard Alert Messages in the TLA are indicated both by the color red and graphically. There are three types of hazard alert graphics used in the TLA: the hazard alert symbol, injury hazard graphics, and avoidance graphics.

This Hazard Alert Symbol is used with the words **DANGER, WARNING,** and **CAUTION.** ANSI defines these words as:

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

HAZARD ALERT MESSAGES

There are two types of graphics used in conjunction with the hazard alert symbol. This type of graphic depicts a specific injury that may be expected if the hazard described in the alert is not avoided.

This second type of graphic is called an avoidance graphic. It depicts an action the student should take in order to avoid injury.

There are two other ANSI words used in the TLAs and the students should understand their meanings:

NOTICE indicates an action that could result in damage to property or equipment.

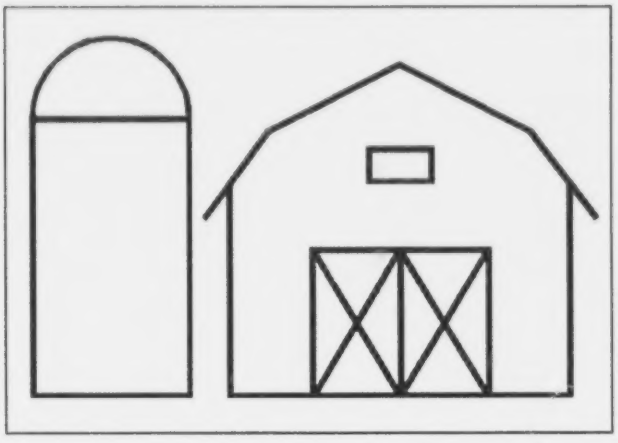
IMPORTANT indicates an instruction that can help the student do a better job.

TECHNOLOGY EDUCATION

AGRICULTURE EDUCATION
SIMFARM™

TE 1123/3123

INSTRUCTOR'S SECTION



BACKGROUND INFORMATION

Few students have had the opportunity to experience the work involved in the daily operation of an American farm. The interactive SimFarm™ software lets the students learn the basic terminology of a farm system while they experience the responsibility of keeping a profitable farm in operation. The Macintosh® and Windows™ versions of the software have options that allow the students to print their farms. The DOS version does not have a print option.

This TLA was written to use the materials in both the SimFarm™ User's Manual and the SimFarm™ Teacher's Guide. If the Teacher's Guide did not come with your SimFarm™ software and you wish to buy it, call 1-800-99MAXIS. If you would rather not use it, optional activities for those days are provided on page 48.

INSTRUCTOR'S SECTION

PRIORITY ACADEMIC STUDENT SKILLS

- The student will know and appreciate the importance of technology and technological literacy.
- The student will explore career opportunities so they can make meaningful occupational choices.
- The student will explore future educational opportunities so they can make meaningful educational choices.
- The student will apply problem solving and critical thinking techniques.
- The student will apply math, science, reading, and other school subjects in a practical situation.
- The student will develop keyboarding and computer literacy skills.
- The student will develop basic skills in the safe and proper use of tools, machines, materials, processes, and technical concepts.
- The student will think logically and sequentially.
- The student will develop leadership, creative abilities, positive self-concepts, and individual potential in a technological society.
- The student will develop an understanding and the ability to adapt to those technological forces that influence life in the 21st Century.

INSTRUCTOR'S SECTION

PRIORITY ACADEMIC STUDENT SKILLS

- The student will develop an understanding of economic development.
- The student will communicate by making clear and relevant points through the development of mental process skills.
- The student will apply design, imagination, and creative abilities.

INSTRUCTOR'S SECTION

SUGGESTED ACTIVITIES

- ✓ Obtain materials to supplement TLA. See Suggested Resources for computer materials to supplement this module.
- ✓ Review instructional outline for this TLA. Modify time frames to suit class needs and plan activities for each class period.
- ✓ Study the specific objectives to determine those you will cover in your presentation. Also decide which objectives should be taught to which students.
- ✓ Determine scope and sequence of objectives that you add to the TLA. Design and develop support materials, including evaluation techniques, for additional objectives.
- ✓ Determine how you will schedule time for students to demonstrate competence in the required procedures.
- ✓ Make arrangements for guest speakers. Supply speakers with specific objectives and other appropriate sections of this TLA.
- ✓ Install the SimFarm™ software. Prepare start-up and printing (if applicable) instructions for the students to follow.
- ✓ Practice using SimFarm™ so that you will be familiar with how it works and what it can do.
- ✓ **Using the Simulations**

  This TLA was written to be used with the SimFarm™ simulations found in the Teacher's Guide. Look at the simulations to decide the best way to use them in your class. It is recommended that an original, or a very clear copy of the student pages be kept with the TLA. Students can answer the questions found in the simulations on notebook paper or on copies of the simulation pages.

INSTRUCTOR'S SECTION

PREPARATION

SUGGESTED ACTIVITIES

The simulations are designed to be used with the DOS or Macintosh® version of SimFarm™; however they will work equally well with the Windows™ version.

If you don't have the teacher's guide, call Maxis at 1-800-99MAXIS for ordering information.

If you choose to not use the simulations, optional activities for those three days are provided on pages 48–50 in this section of the TLA. You may copy those pages and provide them for the students to use in place of the simulations.

✓ The DOS version does not have a print option; the Windows™ and Macintosh® versions do. If your students will be printing, practice the print process listed below. The examples describe printing a farm's balance sheet. Any window of the farm may be printed.

If you are using **Windows™:**

- Arrange the balance sheet on the screen to the way you want it to print. Press **PRINT SCREEN** to copy the balance sheet to the clipboard.
- Close or minimize SimFarm™. Open Paintbrush or another paint program. Paste the balance sheet from the clipboard using the program's paste function. (in Paintbrush, select **Paste** from the **Edit** menu)
- Print the balance sheet following the print directions for the paint program. (in Paintbrush select **Print** from the **File** menu) Follow your teacher's instructions about saving the balance sheet.

INSTRUCTOR'S SECTION

SUGGESTED ACTIVITIES

If you are using a **Macintosh®** computer:

- Arrange the balance sheet on the screen to the way you want it to print. Press **APPLE SHIFT 3** to copy the balance sheet to the clipboard. It will take a couple of seconds for the balance sheet to be saved to your hard drive. Close or minimize SimFarm™
- Open your hard drive's main folder. Find the balance sheet file you just saved. It is a graphic file, probably named Picture 1 or something similar.
- Use a paint program to open the balance sheet file.
- Print the balance sheet following the print directions for the paint program. Follow your teacher's instructions about saving the balance sheet.

✓ If you are using a program that allows printing, decide which activities the students will print. It is suggested that the student-created farm (Days 6–7) be assigned.

✓ If there is a problem printing, you can contact the Technical Support Department of Maxis Software at 510-253-3755 for suggestions.

✓ Provide pictures and articles about real farms. Local farmers and farm equipment dealers in your area may be able to help you find resources.

✓ Allow time for students who to give an oral presentation over what they learned about agriculture. They can show printouts of the farms they created.

INSTRUCTOR'S SECTION

SUGGESTED RESOURCES

Bentley, Tom. *SimFarm™ User Manual.* Maxis. Orinda, California 94563-3346, 1993.

Larson, Deborah. *SimFarm™ Teacher's Guide.* Maxis. Orinda, California 94563-3346, 1994.

Bentley, Tom. *SimFarm™ User Manual.* Maxis. Orinda, California 94563-3346, 1993.

Larson, Deborah. *SimFarm™ Teacher's Guide.* Maxis. Orinda, California 94563-3346, 1994.

Grolier Inc., The New Grolier Multimedia Encyclopedia, Software Toolworks , Inc.: Novato, CA, 1993

INSTRUCTOR'S SECTION

WORKSTATION BOOKSHELF

INSTRUCTOR'S REFERENCE MATERIALS

Instructional Sequence	Technology Education: Agriculture Education—SimFarm™		
	Assignments	**Equipment, Tools, and Supplies**	**Facilities Requirements/ Modifications**
Day 1	Take Pretest. Read and study the Assignment Checklist, Words You Should Know, Priority Academic Student Skills, TSA Competitive Events, and Academic and Workplace Skills. Complete Objective 1: Complete pages 2–11 of the tutorial in the SimFarm™ Users Manual.	Computer Score Sheet/card or notebook paper for Pretest Computer with SimFarm installed SimFarm User's Guide	
Day 2	Complete Objective 2:Complete pages 12–30 of the tutorial in the SimFarm™ Users Manual. Complete Objective 3: Use each of the SimFarm™ windows. Complete Objective 4: Use the Farm Expert.	Computer with SimFarm installed SimFarm User's Guide Paper	
Days 3, 4, 5	Complete Objective 5: Complete the Building a Farm simulation. Complete Objective 6: Complete the Unit 1 Agriculture simulations listed below. Chemicals and Crops Crops and Weather The Liveliest Stock of All Complete Objective 7: Complete the Unit 2 *The Numbers of Farming* simulations listed below. Understanding the Balance Sheet In the Money Have a Cow! Complete the Unit 3 *Farming Is Serious Business* simulations listed below. Buying vs. Leasing Charting Crops' Profitability Stored Crops and Market Value	Computer with SimFarm installed SimFarm User's Guide SimFarm Teacher's Guide	

Instructional Sequence	Technology Education: Agriculture Education—SimFarm™		
	Assignments	**Equipment, Tools, and Supplies**	**Facilities Requirements/ Modifications**
Days 6 and 7	Complete Objective 9: Using any of SimFarm's™ features, design and operate your own farm. Complete Objective 10: Describe your farm. Complete Objective 11: Using correct grammar and spelling, write a 1-page essay discussing whether or not you would enjoy working in a agriculture-related occupation.	Computer with SimFarm installed SimFarm User's Guide Paper	
Day 8	Complete any incomplete assignments. Read and study Impact Statements. Complete Career Search activities. Take Posttest and Spelling Test. Hand in assignments.	Computer Score Sheet/card or notebook paper for Posttest and Spelling Test. Paper for career essay	
Skunk Works	Evaluate,Improve or recreate your farm	Computer with SimFarm installed SimFarm User's Guide	

BEST COPY AVAILABLE

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Equipment, Tools, and Supplies: Summary Worksheet

Equipment, Tools,and Supplies	Per Student	Per Period	Total Needed	Special Considerations	Cost Per Student	Cost Per Period	Total Needed	Special Considerations
Computer Score Sheet/card or notebook paper	1							
Computer with SimFarm installed		1						
SimFarm User's Guide		1						
SimFarm Teacher's Guide		1						
Paper	several sheets							

SUMMARY WORKSHEET

INSTRUCTOR'S SECTION

PRETEST

1. A farm's management has a direct influence on the
   a. market value of crops and animals
   b. prosperity of the farm
   c. community's economy
   d. All of the above

2. If your animals aren't fenced in, they will
   a. run to the barn and hide
   b. eat or destroy your crops
   c. stay close to the food and water
   d. go to a neighbor's farm

3. To harvest a crop, you must own or lease all the equipment listed below except
   a. a trailer
   b. a tractor
   c. a harvester
   d. a truck

4. If you don't have the farm equipment you need to harvest your crops, you have to
   a. lease it immediately and pay leasing charges
   b. buy it immediately after the harvest
   c. borrow it from your neighbors
   d. let the crops die in the field

5. If your farm prospers, the community
   a. has to sell the town to you
   b. grows and prospers
   c. doesn't change at all
   d. buys your farm

6. Fertilizer replaces nutrients taken away from the soil by a crop.
   a. True
   b. False

INSTRUCTOR'S SECTION

PART 1

PRETEST

7. You have to immediately sell your crop after harvest unless
   a. you don't like the market value price
   b. you have a truck and trailer
   c. you have a silo for storage
   d. you have a big barn

8. If you vote in a SimFarm™ election and your side loses, you
   a. won't have to pay taxes for the improvements
   b. never vote wrong because its your game
   c. can file a protest to the election
   d. will be taxed regardless of your opinion

9. Market value is
   a. the highest price you can bargain for
   b. the amount a perfect crop brings
   c. the value of your crop
   d. what is paid for not growing crops

10. Once you've sold your crop on the futures market, you
    a. hope the price is unchanged
    b. don't care because you already have your money
    c. hope the price rises
    d. hope the price falls

INSTRUCTOR'S SECTION

PART 2

POSTTEST

11. A farm's management has a direct influence on the
    a. market value of crops and animals
    b. prosperity of the farm
    c. community's economy
    d. All of the above

12. If your animals aren't fenced in, they will
    a. run to the barn and hide
    b. eat or destroy your crops
    c. stay close to the food and water
    d. go to a neighbor's farm

13. To harvest a crop, you must own or lease all the equipment listed below except
    a. a trailer
    b. a tractor
    c. a harvester
    d. a truck

14. If you don't have the farm equipment you need to harvest your crops, you have to
    a. lease it immediately and pay leasing charges
    b. buy it immediately after the harvest
    c. borrow it from your neighbors
    d. let the crops die in the field

15. If your farm prospers, the community
    a. has to sell the town to you
    b. grows and prospers
    c. doesn't change at all
    d. buys your farm

16. Fertilizer replaces nutrients taken away from the soil by a crop.
    a. True
    b False

INSTRUCTOR'S SECTION

PART 1

POSTTEST

17. You have to immediately sell your crop after harvest unless
    a. you don't like the market value price
    b. you have a truck and trailer
    c. you have a silo for storage
    d. you have a big barn

18. If you vote in a SimFarm™ election and your side loses, you
    a. won't have to pay taxes for the improvements
    b. never vote wrong because its your game
    c. can file a protest to the election
    d. will be taxed regardless of your opinion

19. Market value is
    a. the highest price you can bargain for
    b. the amount a perfect crop brings
    c. the value of your crop
    d. what is paid for not growing crops

20. Once you've sold your crop on the futures market, you
    a. hope the price is unchanged
    b. don't care because you already have your money
    c. hope the price rises
    d. hope the price falls

INSTRUCTOR'S SECTION

PART 2

POSTTEST

21. erosion
22. ecosysteme
23 iragation
24. feilds
25. salinity
26. herbiside
27. enviroment
28. cultivation
29. agriculture
30. markit valu

INSTRUCTOR'S SECTION

SPELLING TEST

TEST ANSWERS

1. d
2. b
3. d
4. a
5. b
6. a
7. c
8. d
9. b
10. d

11. d
12. b
13. d
14. a
15. b
16. a
17. c
18. d
19. b
20. d

21. a
22. b
23. b
24. b
25. a
26. b
27. b
28. a
29. a
30. b

INSTRUCTOR'S SECTION

PRETEST ANSWERS

POSTTEST ANSWERS

SPELLING TEST ANSWERS

EVALUATION SUMMARY

5 POINTS EACH

Pretest _____

Career Search _____

Objective 1: Complete pages 2–11 of the tutorial in the SimFarm™ Users Manual. _____

Objective 2: Complete pages 12–30 of the tutorial in the SimFarm™ Users Manual. _____

Objective 3: Use each of the SimFarm™ windows. _____

Objective 4: Use the Farm Expert. _____

10 POINTS EACH

Objective 5: Complete the Building a Farm simulation. _____

Objective 6: Complete the Unit 1 *Agriculture* simulations listed below. _____

- Chemicals and Crops
- Crops and Weather
- The Liveliest Stock of All

Objective 7: Complete the Unit 2 *The Numbers of Farming* simulations listed below. _____

- Understanding the Balance Sheet
- In the Money
- Have a Cow!

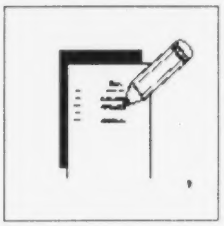
Objective 8: Complete the Unit 3 *Farming Is Serious Business* simulations listed below. _____

- Buying vs. Leasing
- Charting Crops' Profitability
- Stored Crops and Market Value

Objective 10: Describe your farm. _____

INSTRUCTOR'S SECTION

1. PROCESS EVALUATION



EVALUATION SUMMARY

15 POINTS EACH

Objective 9: Using any of SimFarm's™ features, design and operate your own farm. _____

Objective 11: Using correct grammar and spelling, write a 1-page essay discussing whether or not you would enjoy working in a agriculture-related occupation. _____

INSTRUCTOR'S SECTION

1. **PROCESS EVALUATION (Continued)**

1. PROCESS EVALUATION SCORE _____

EVALUATION SUMMARY

The instructor is encouraged to individualize the TLA to address the specific needs of each student, considering age and ability level. In addition to the specific areas on the chart below, the instructor should take into account the student's desire, enthusiasm, etc.

Evaluation based upon = 100 possible points, broken down as follows.

EVALUATION RATING TABLE

Student Name: _____

Criteria	Points Possible	Points Earned
Day 2 Writing Activity	10	_____
Simulations unit 1	15	_____
Simulations unit 2	15	_____
Simulations unit 3	15	_____
Day 7 Essay	10	_____
Student-created farm	20	_____
Day 8 Career Essay	15	_____

INSTRUCTOR'S SECTION

2. PRODUCT EVALUATION

2. PRODUCT EVALUATION SCORE _____

EVALUATION SUMMARY

Posttest Score: _____

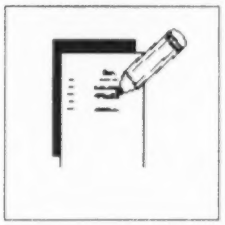
EVALUATION WORKSHEET

1. Process evaluation score = _____
2. Product evaluation score = _____
3. Written evaluation score = _____
4. Total score = _____

Divide Total Score by 3 to get TLA score.

INSTRUCTOR'S SECTION

3. WRITTEN EVALUATION



3. WRITTEN EVALUATION SCORE _____

Total Score for TLA **=1+2+3**

The *Total Score for TLA* divided by 3 equals the TLA score.

TLA SCORE _____

BIBLIOGRAPHY

Bentley, Tom. *SimFarm™ User Manual.* Maxis. Orinda, California 94563-3346, 1993.

Larson, Deborah. *SimFarm™ Teacher's Guide.* Maxis. Orinda, California 94563-3346, 1994.

Grolier Inc., The New Grolier Multimedia Encyclopedia, Software Toolworks , Inc.: Novato, CA, 1993

INSTRUCTOR'S SECTION

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

List responsibilities involved with farming.

Discuss the risks of depending on the environment for a productive farm.

Rebuild or restore a farm's productivity after a disaster from the weather.

➢ SimFarm™ software and User's Manual

On Days 3, 4, and 5, you will be working with scenario farms created by the SimFarm™. It may be helpful to quickly review the reference section of the *User's Manual* (pages *32*–92). For the remaining days in this TLA, you will be responsible for the farms you select or create. The more familiar you are with the information in the reference section, the easier it will be to work your farm.

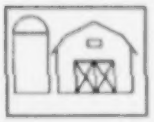
Farmers are responsible for everything that happens on a farm. They are also constantly at the mercy of the environment, especially the weather. A farm's profit at the end of the year is directly related to the weather and other natural elements encountered during the year as well as to how well the farm was run.

FOLLOW THESE STEPS:

STEP 1: Follow your teacher's instructions to turn on the computer and open SimFarm™. Read the "Scenarios and Games" section on page 38.

STEP 2: On the **Select a Region** window, click in the center of one of the boxes found on the map. When selected, the box will change color. Then select the **Use this Region** button. The screen will change to a completed farm with the map window opened. This will be the farm you manage today.

DAYS 3, 4, 5 ACTIVITIES



OBJECTIVE 5, 6. and 7

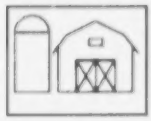
TOOLS AND MATERIALS

INTRODUCTION

PROCEDURE

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAYS 3, 4, 5 ACTIVITIES

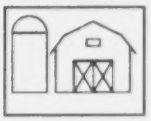


STEP 3: During this class period, you are to manage this farm. Feel free to modify it in any way you see necessary. You may make it larger or smaller in order to fit your personal work load. The strategies found on pages 88–92 of the *User's Manual* provide some helpful pointers. A few other tips are listed below.

- The speed of the game can be controlled by the person playing it by clicking on the **Speed** menu and choosing the desired speed. (see page 43) Choose the rate at which you want to work. You can change the speed at any time according to your own pace. Advanced farmers can work at Ultra Speed.
- **Pause** can be used to stop the action on your farm. When ready to resume, choose your speed and continue.

STEP 4: As you work on your farm, think about some of the things farmers are responsible for. On a sheet of paper, list some of these responsibilities.

STEP 5: After you have a farm up and running well, experiment with each of the disasters listed in the **Disasters** menu. Begin by reading the "Disasters" section on page 39. It is not advisable to try more than one disaster at a time. This can lead to more stress than most farmers can deal with.



STEP 6: Select **Tornado** from the **Disasters** menu. Observe its position on the terrain. Continue with daily operations of farm until the Tornado passes through the countryside.

STEP 7: When the tornado is over, make any repairs necessary to your farm and check your crops for any spraying requirements.

STEP 8: Continue the farm scenario experimenting with all the other disasters. As you experience each disaster, briefly describe its effects. Write your descriptions on a sheet of paper to give to the teacher.

STEP 9: Turn off the computer by following your teacher's instructions. Return all materials to the proper place and clean up your work area.

If you complete Day 5 Activities with time left over, you may begin Day 6 Activities.

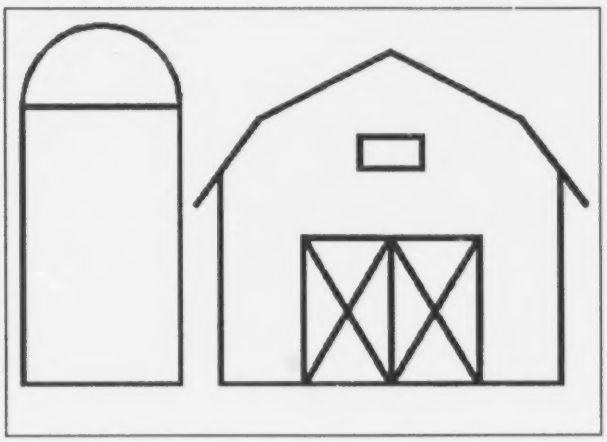
TECHNOLOGY EDUCATION

TECHNOLOGY LEARNING ACTIVITY

TE3123

AGRICULTURE EDUCATION
SIMFARM™

Suggested Time: 8 Days



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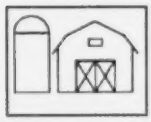
TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

On Day 1 you should complete the following activities:

1. Complete Pretest
2. Read Assignments to Turn In (items to completed in 8 days)
3. Read Goal
4. Read Words You Should Know
5. Read Priority Academic Student Skills
6. Read Objectives
7. Read Related TSA Competitive Events
8. Read Academic and Workplace Applications
9. Read Information Sheet
10. Complete Objective 1

DAY 1 ACTIVITIES



SUMMARY OF ACTIVITIES

Reading Comprehension
- Gain factual information
- React to written material

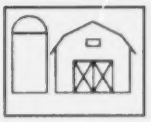
Functional Reading
- Follow written instructions
- Interpret graphics and symbols
- Use content area vocabulary

Information Analysis
- Interpret maps/globes

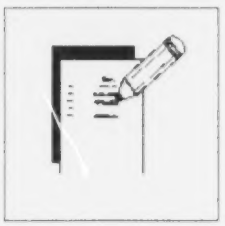
Social Studies Application
- Investigate/apply US Geography
- Investigate/apply principles of economics

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAY 1 ACTIVITIES



PRETEST INSTRUCTIONS



You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the TLA, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-10 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of paper to record your answers and number your answers 1-10.

Get Pretest Questions from your instructor.

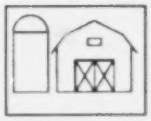
When you finish the Pretest, return the test form and the computer scan card or notebook paper to your instructor.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

At the end of 8 days, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet, with answers to:
   a) Pretest
   b) Posttest (including spelling test)
2. Day 2 written responses
3. Simulation "Thinking It Over" activities
   a) Unit 1 *Agriculture*
   b) Unit 2 *The Numbers of Farming*
   b) Unit 3 *Farming Is Serious Business*
4. Day 7 essay
5. Description of student-designed farm including printouts or teacher demonstration
6. Career Search Activity
   a) Two careers identified
   b) Explanation of why those occupations appealed to you

DAY 1 ACTIVITIES

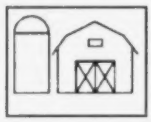


ASSIGNMENTS TO TURN IN

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

The *Agriculture Education SimFarm*™ TLA will introduce you to the science of farming, including agricultural engineering, management, soil science, plant production, animal production, and agricultural economics.

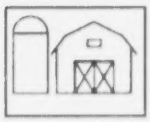
DAY 1 ACTIVITIES



GOAL

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAY 1 ACTIVITIES



WORDS YOU SHOULD KNOW

agriculture — the science or art of cultivating the soil or producing crops and livestock for man's use

crop — products, both plants and animals, grown on a farm

crop rotation — the process of growing different crops in succession with other crops in order to enrich the soil

corporate farms — large farms owned by families that have incorporated or major corporations that have diversified into the agricultural business

ecosystem — the overall structure of how animals, plants, and the land function together to make a unit in nature

erosion — the loss of a farmland's topsoil and its nutrients by wind or water

farm — a plot of land devoted to the raising of crops and animals for consumption

fertilizer — a substance or chemical used to make a soil more fertile or to replace nutrients that previous crops have taken away

fungicide — a poison used to kill fungus in plants

futures market — a program that allows farmers to sell their crops, at the current market value, months before they are harvested

harvest — the final act or process in the production of a crop

herbicide — a poison used to destroy weeds

homestead — SimFarm™ term for the farmhouse and all other property enclosed within the computer's fence

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

implement — A tool such as a combine or plow used in the routine work of farming

irrigation — supplying land with water by artificial means to help nourish plant growth

livestock — the general term for animals kept for use and/or profit on the farm.

market value — the price at which buyers and sellers are willing to do business based on the current value of the highest grade of a certain crop

pesticide — a poison used to destroy pests

plow — an implement pulled behind a tractor that breaks up a field before it is planted

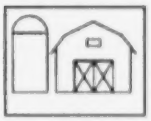
salinity — the presence of salt in the soil

silo — a place to store what is harvested

toxins — any substance that poisons plants or the soil they grow in

windbreaks — trees or bushes planted specifically to keep the wind from blowing soil off the fields

DAY 1 ACTIVITIES

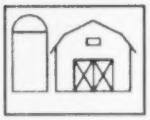


WORDS YOU SHOULD KNOW

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

- The student will know and appreciate the importance of technology and technological literacy.
- The student will explore career opportunities so they can make meaningful occupational choices.
- The student will explore future educational opportunities so they can make meaningful educational choices.
- The student will apply problem solving and critical thinking techniques.
- The student will apply math, science, reading, and other school subjects in a practical situation.
- The student will develop keyboarding and computer literacy skills.
- The student will develop basic skills in the safe and proper use of tools, machines, materials, processes, and technical concepts.
- The student will think logically and sequentially.
- The student will develop leadership, creative abilities, positive self-concepts, and individual potential in a technological society.
- The student will develop an understanding and the ability to adapt to those technological forces that influence life in the 21st Century.
- The student will develop an understanding of economic development.

DAY 1
ACTIVITIES

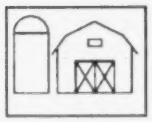


PRIORITY ACADEMIC STUDENT SKILLS

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

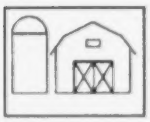
- The student will communicate by making clear and relevant points through the development of mental process skills.
- The student will apply design, imagination, and creative abilities.

DAY 1 ACTIVITIES



TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAY 1 ACTIVITIES



OBJECTIVES

At the completion of this Technology Learning Activity, the you should be able to:

1. Complete pages 2–11 of the tutorial in the SimFarm™ Users Manual.
2. Complete pages 12–30 of the tutorial in the SimFarm™ Users Manual.
3. Use each of the SimFarm™ windows.
4. Use the Farm Expert.
5. Complete the *Building a Farm* simulation.
6. Complete the Unit 1 *Agriculture* simulations listed below.

   Chemicals and Crops

   Crops and Weather

   The Liveliest Stock of All
7. Complete the Unit 2 *The Numbers of Farming* simulations listed below.

   Understanding the Balance Sheet

   In the Money

   Have a Cow!
8. Complete the Unit 3 *Farming Is Serious Business* simulations listed below.

   Buying vs. Leasing

   Charting Crops' Profitability

   Stored Crops and Market Value
9. Using any of SimFarm's™ features, design and operate your own farm.
10. Describe your farm.
11. Using correct grammar and spelling, write a 1-page essay discussing whether or not you would enjoy working in a agriculture-related occupation.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

The following TLA Competitive Events apply to your study of *Control Robotics Programming Technology.*

- Technical Research and Report Writing
- Extemporaneous Speech
- Prepared Speech

See TSA Competitive Events Guidelines for specific details on the competitions.

DAY 1 ACTIVITIES

RELATED TSA COMPETITIVE EVENTS

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

The symbols in the right column are used to identify the Academic and Workplace Applications that are reinforced by specific activities in this TLA.

Reading Skills Applied:

Reading Comprehension
- Gain factual information
- React to written material

Functional Reading
- Follow written instructions
- Interpret graphics and symbols
- Use content area vocabulary

Writing Skills Applied:

Language Skills:
- Use standard grammar, spelling, and capitalization
- State ideas clearly

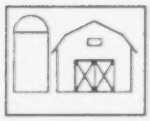
Functional Writing:
- Use computer graphics

Mathematics Skills Applied:

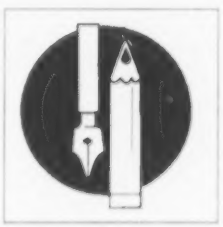
Data Analysis and Display
- Interpret graphs
- Collect/record data

Functional Math
- Solve practical problems
- Calculate gross earnings

DAY 1
ACTIVITIES

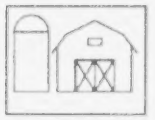


ACADEMIC AND WORKPLACE APPLICATIONS



TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

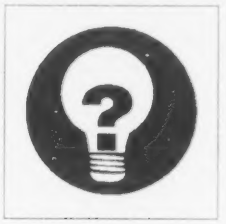
DAY 1 ACTIVITIES



reative Thinking and Problem Solving Skills Applied:

Cognitive Activities

- Identify critical elements/issues
- Define a problem
- Apply a problem-solving model
- Analyze/synthesize information
- Identify/analyze underlying assumptions
- Draw conclusions
- Identify/evaluate consequences
- Evaluate alternatives
- Select an alternative
- Devise a solution
- Create a finished product
- Transfer knowledge/training to new situations
- Evaluate results/outcomes



Employability Skills Applied:

Job Search/ Selection

- Analyze personal occupational aptitudes/preferences
- Investigate employment prospects of a career field/occupation
- Investigate training requirements for a career field/occupation
- Investigate benefits of a career field/occupation

Social Studies Skills Applied:

Information Analysis

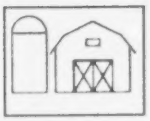
- Interpret graphical information
- Construct graphical information
- Interpret maps/globes

Social Studies Application

- Investigate/apply US Geography
- Investigate/apply principles of economics

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAY 1
ACTIVITIES



INFORMATION SHEET

Thousands of years ago people did not farm or even raise animals for food. The only way these people knew to get food was to hunt wild animals or pick the wild, edible plants that happened to grow where they were. This method was OK as long as there were animals to hunt and plants to pick. However, since the animals were wild, they tended to migrate over large areas. This meant the people dependent on them for food had to migrate with them. The people had no permanent homes because they always had to follow the food supply.

As time passed, the people began to realize that life would be better if they had a permenent, dependable food supply. That way they could settle in one place and would always have food to eat. At first people simply trapped wild animals in caves so they couldn't leave. Eventually they began to raise, domesticate, and herd wild animals.

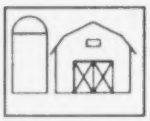
At about the same time, someone realized that seeds could be planted to grow food. No one is exactly sure how people figured this out. Most people think it was probably the result of accidentally spilling some seeds that naturally grew and were noticed. People put two and two together and realized they could plant seeds themselves. Slowly they realized that seeds could be stored for later planting and that some seeds grew better than others.

Over the years people found many ways to make agriculture easier. At first it was something as simple as using a stick to break up the soil. Slowly people invented tools and machines to make the work easier, faster, and more productive. At first animal-driven plows and reapers increased production. Then animal driven tools were replaced by engine-driven machines.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

Even today, new technologies are evolving to make agriculture more efficient. These technologies not only make agriculture more productive; they also often make it safer for both the farmer and the consumer. They have also made it possible for fewer and fewer farms and farmers to grow more and more food. Unlike early farmers who mostly provided for their own families, today's farmers truly feed the world.

DAY 1 ACTIVITIES



TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

Complete pages 2–11 of the tutorial in the SimFarm™ Users Manual.

➤ SimFarm™ software and User's Manual

☑**NOTE:** Before beginning this TLA, you should be familiar with the basic operation of the computer you will be using. You should be able to use a mouse to do the following:

- **Point** to an object
- **Click** on an object to select it
- **Drag** an object to a new location or select from a menu
- **Double click** on an object
- **Shift click** on an object

FOLLOW THESE STEPS:

STEP 1: Now let's start learning about SimFarm™. Follow your teacher's instructions to turn on the computer and opening SimFarm™.

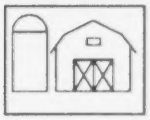
STEP 2: Open the *SimFarm™ User's Manual* to page 2. Read the introductory material.

STEP 3: Start the tutorial activities by reading the quotation on page 3. Read and work through the tutorial activities on pages 4–11.

☑**NOTE:** The words in boldface type in the tutorial are commands that you complete on the computer.

STEP 4: When you have completed the tutorial activities, you will need to save your farm to use later. Follow your teacher's directions for saving your farm. Turn off the computer by following your teacher's instructions.

DAY 1 ACTIVITIES



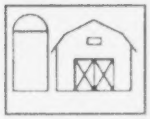
OBJECTIVE 1

TOOLS AND MATERIALS

PROCEDURE

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAY 1 ACTIVITIES



Return all materials to their proper storage areas and clean up your work area.

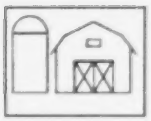
If you complete Day 1 Activities with time left over, you may begin Day 2 Activities.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

On Day 2 you should complete the following activities:

1. Complete Objective 2
2. Complete Objective 3
3. Complete Objective 4

DAY 2 ACTIVITIES



SUMMARY OF ACTIVITIES

Functional Reading
- Follow written instructions
- Interpret graphics and symbols
- Use content area vocabulary

Information Analysis
- Interpret maps/globes

Social Studies Application
- Investigate/apply US Geography

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

Complete pages 12–30 of the tutorial in the SimFarm™ Users Manual.

Use each of the SimFarm™ windows.

Use the Farm Expert.

➤ SimFarm™ software and User's Manual.

FOLLOW THESE STEPS:

STEP 1: Follow your teacher's instructions to turn on the computer and open SimFarm™. Load the farm you saved on Day 2 by clicking **Load a Saved Game** from the **Select a Region** screen. Find your farm and click its name to open.

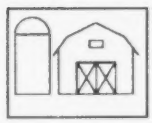
STEP 2: Open the *SimFarm™ User's Manual* to page 12. Complete the tutorial activities by working through page 30. Do not exit from your farm.

STEP 3: Review the material in the reference section of the *SimFarm™ User's Manual on pages 32–92*. As you look at the material, you can experiment with the software.

STEP 4: Experiment with the windows listed below.

- Buy Window
- Sell Window
- Evaluation Window
- Map Window
- Weather Window
- Balance Sheet Window
- Bank Window
- Edit Window
- Market Value Window

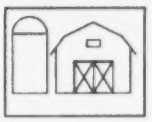
DAY 2 ACTIVITIES



OBJECTIVES 2, 3, AND 4

TOOLS AND MATERIALS

PROCEDURE



STEP 5: On a sheet of paper, describe each of the SimFarm™ windows. (This information can be found on pages 44, 48, 55, and 58–64.)

STEP 6: Open the **Farm Expert** window. It is found in the **Help Menu** in the Windows™ and Macintosh® versions and in the **Windows Menu** in DOS.

STEP 7: Click on each of the boxes in the **Farm Expert** to review the information found in each. Briefly describe the use of the farm expert. (see page 64)

STEP 9: Write your name and any other teacher-needed information on your paper. Turn it in to your teacher.

STEP 10: Turn off the computer by following your teacher's instructions. Return materials to their proper storage areas and clean up your work area.

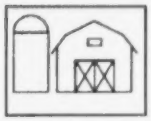
If you complete Day 2 Activities with time left over, you may begin Day 3 Activities.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

On Day 3, 4, and 5 you should complete the following activities:

1. Complete Objective 5
2. Complete Objective 6
3. Complete Objective 7
4. Complete Objective 8

DAYS 3, 4, 5 ACTIVITIES



SUMMARY OF ACTIVITIES

Data Analysis and Display
- Interpret graphs
- Collect/record data

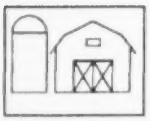
Functional Math
- Solve practical problems
- Calculate gross earnings

Information Analysis
- Interpret graphical information
- Construct graphical information
- Interpret maps/globes

Social Studies Application
- Investigate/apply US Geography
- Investigate/apply principles of economics

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAYS 3, 4, 5 ACTIVITIES



OBJECTIVES 5, 6, 7 and 8

Complete the Building a Farm simulation.

Complete the Unit 1 *Agriculture* simulations listed below.

- Chemicals and Crops
- Crops and Weather
- The Liveliest Stock of All

Complete the Unit 2 *The Numbers of Farming* simulations listed below.

- Understanding the Balance Sheet
- In the Money
- Have a Cow!

Complete the Unit 3 *Farming Is Serious Business* simulations listed below.

- Buying vs. Leasing
- Charting Crops' Profitability
- Stored Crops and Market Value

TOOLS AND MATERIALS

- SimFarm™ software, User's Manual, and Teacher's Guide
- Copies of the Simulations from the Teacher's Guide

INTRODUCTION

On Days 3, 4 and 5, you will be working with several SimFarm™ simulations. These simulations will help you understand the basics of farming and of SimFarm™. They will prepare you for Days 6 and 7 when you create your own farm.

PROCEDURE

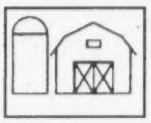
FOLLOW THESE STEPS:

STEP 1: Follow your teacher's instructions to turn on the computer and open SimFarm™.

STEP 2: Find the Simulation **Building a Farm.** The farm you create with this simulation will be used throughout the other simulations.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAYS 3, 4, 5 ACTIVITIES



STEP 3: Start with the first step in the **Design Your Terrain** section. Follow the instructions on the simulation sheets to complete the farm.

STEP 4: Complete as many of the simulations as time permits or as your teacher assigns. Always follow the instructions on the sheets.

STEP 5: Follow your teacher's instructions to complete the Thinking It Over sections of each simulation. Be sure to turn these in to your teacher when completed.

STEP 6: Return all materials to the proper place and clean up your work area.

If you complete the Activities for Days 3, 4, and 5 with time left over, you may begin Day 6 Activities.

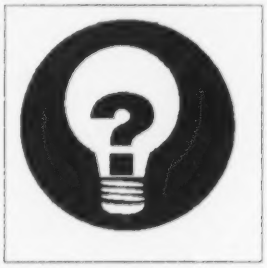
TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

On Days 6 and 7 you should complete the following activities:

1. Complete Objective 9
2. Complete Objective 10
3. Complete Objective 11

DAYS 6–7 ACTIVITIES

SUMMARY OF ACTIVITIES



Cognitive Activities

- Collect/record information
- Identify critical elements/issues
- Define a problem
- Apply a problem-solving model
- Analyze/synthesize information
- Identify/analyze underlying assumptions
- Draw conclusions
- Identify/evaluate consequences
- Evaluate alternatives
- Select an alternative
- Devise a solution
- Create a finished product
- Transfer knowledge/training to new situations
- Evaluate results/outcomes

Information Analysis

- Interpret graphical information
- Construct graphical information
- Interpret maps/globes

Social Studies Application

- Investigate/apply US Geography
- Investigate/apply principles of economics

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

Using any of SimFarm's™ features, design and operate your own farm.

Describe your farm.

Using correct grammar and spelling, write a 1-page essay discussing whether or not you would enjoy working in a agriculture-related occupation.

DAYS 6–7 ACTIVITIES

OBJECTIVE 9, 10 and 11

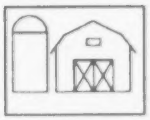
TOOLS AND MATERIALS

- SimFarm™ software and User's Manual
- Windows Paintbrush or another paint program (for printing if applicable)

INTRODUCTION

Owning and operating a farm is an expensive undertaking today. A successful farmer probably has a very close relationship with his banker. Financial advice and support is a must in today's farming world. A 4-wheel drive tractor costs more than $90,000. Implements and equipment such as plows, planters, and harvesters can easily add up to another $100,000. Yearly maintenance and repairs on this equipment add up. A farmer in the central part of the United States can easily have capital investments of $1.5 million in land and equipment, but only sell $300,000 in livestock and crops. The net income from this farm; depending on expenses caused by weather problems, production costs, and consumer demand; can be $30,000 or less.

These high expenses have forced many farms to become corporate or foreign-investor owned. There are fewer and fewer family-owned farms. Although the number of people working on farms or in farm-related areas is growing, many of these people do not own the farm, although some of these people may own shares in the corporation. Today over half of farmers who work on their own farms are over the age of 60. Many of their children have moved to the city and have no interest in



working or living on the farm. This is forcing even family-owned farms to employ farm workers to run and work the farm. This has been the trend for over 25 years.

Today nearly half the world's population is working in agricultural jobs. With these trends, there is a possiblity and an opportunity for the young people of America to return to the farm and be involved in challenging agricultural careers

For the next two days you will be creating your own farm. Obviously, your goal is to have your farm prosper. While creating your own farm, you can use any part of the software. There are 24 crops within the software. Some can make you more money than others.

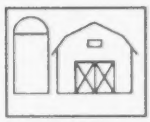
As you learned in the earlier activities, when your farm grows and prospers, your farmhouse gets larger and so do your assets. While this happens, a screen appears periodically telling you that the town near you is purchasing a new plot of land. The mayor asks you to vote on the type of development you prefer. Even if you vote with the minority, when the town's construction starts, your funds drop because Simfarm collects your taxes. If your town grows, so does your farm. In SimFarm™, just as in the real world, growth and prosperty are measured by new development.

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Follow your teacher's instructions to turn on the computer and open SimFarm™. Read and review the "Strategies" section that begins on page 88. Keep this section handy to refer to as you work on your farm.

STEP 2: On the **Select a Region** window, click on the map where you want your farm to be. It can be anywhere. When selected, a small box appears



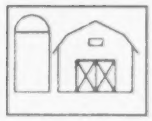
on the map. Then select the **Use this Region** button if you want to take the land as it is or the **Design Your Own** button if you want to customize the land. (see pages 4–5 if you need help) The screen will change to a completed farm with the map window opened. This will beyour farm.

STEP 3: During the next two class periods, you are to manage this farm. Feel free to modify it in any way you see necessary. You may make it larger or smaller in order to fit your personal work load. Remember, the strategies found on pages 88–92 of the *User's Manual* provide some helpful pointers.

STEP 4: At the end of Day 6, be sure to save your farm for tomorrow. Follow your teacher's instructions for saving. The **Save** command is in the **File** menu. On Day 7 you will need to load the farm you saved clicking **Load a Saved Game** from the **Select a Region** screen. Find your saved farm and click its name to open the farm.

STEP 5: Allow enough time at the end of Day 7 to write a one-page summary describing your thoughts about agriculture. Tell whether you think you would be interested in it as a career.

STEP 6: At the end of Day 7, print or show the teacher each window of your farm, including the balance sheet. To print, follow your teacher's instructions. On a sheet of paper or on the back of the printed pages, describe your farm, telling where it is



located, why you chose the crops, livestock, etc. Turn these in to your teacher on Day 8.

STEP 7: Follow regular procedures to save your final farm.

STEP 8: Turn off the computer by following your teacher's instructions. Return all materials to the proper place and clean up your work area.

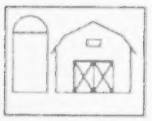
If you complete Days 6 and 7 Activities with time left over, you may begin Day 8 Activities.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

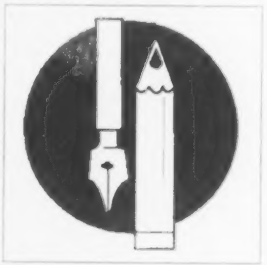
On Day 8 you should complete the following activities:

1. Read Impact Statements
2. Complete Career Search Activity
3. Complete any unfinished assignments
4. Complete Posttest

DAY 8 ACTIVITIES



SUMMARY OF ACTIVITIES



Language
- Use standard grammar, spelling, and capitalization
- State ideas clearly

Functional Writing
- Use computer graphics

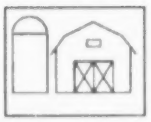
Job Search/ Selection
- Analyze personal occupational aptitudes/preferences
- Investigate employment prospects of a career field/occupation
- Investigate training requirements for a career field/occupation
- Investigate benefits of a career field/occupation

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

Farming by its very nature has an effect on the environment because anything done to the land also affects the environment. Early farmers understood little about the environment. Many farmed until the soil would no longer produce crops because it was depleted of its nutrients. They moved on to new land and started over. Their methods of plowing and cultivating caused soil erosion resulting in the loss of topsoil. Occasionally fertilizers, pesticides, and herbicides caused the plants to be toxic to some animals and possibly to humans. Today's farmers are more aware of the problems that poor farming methods can cause. Soil isn't farmed until it is depleted. Consumer awareness and more effective research into the safety of the chemicals used has helped to make today's farm more environmentally safe.

The change from small, family-owned farms to large, corporate-owned farms has caused some social changes. At one time, a majority of people lived on farms for their whole lives. Today, a majority of people live in cities; some people have never even seen a farm. It is difficult today for an individual with a small farm to make a living farming; it is too expensive. These people, who at one time would have taken over a family farm, are now moving to the city and looking for jobs. With fewer and fewer people living in rural areas, it becomes less profitable for a doctor or dentist to practice in small towns. Farm families sometimes have to travel longer distances to shop or get medical care.

DAY 8 ACTIVITIES

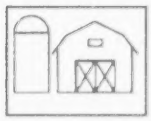


ENVIRONMENTAL IMPACT

SOCIAL IMPACT

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAY 8
ACTIVITIES



ECONOMIC IMPACT

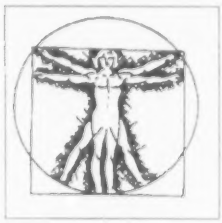
The agricultural industry has a huge effect on the economy. Farming today is a big, very expensive, business. The cost of farm supplies and equipment has a direct effect on the cost of the food to the consumer. If food costs the consumers more, they have less to spend on other products. The high cost of running farms has caused many small farmers to sell out to the bigger farm operations.

POLITICAL IMPACT

Although it is not as powerful as it once was, agriculture still has a big influence on politics and government. Candidates for national and state offices try to win support from the farmers. Many farm prices are controlled by federal price supports and subsidies. Sometimes farmers are paid to not produce crops so that surpluses are limited. Farmers lobby politicians to keep the aid they have. Import and export controls on farm products also help the farmers by keeping prices at a profit level.

ERGONOMIC IMPACT

Agriculture has an ergonomic effect on each of us. New methods are continually producing better quality fruits and vegetables. Controls on the use of fertilizers, pesticides, and other chemicals help ensure that the food we buy will be safe. Farm research is continually producing not only better food products, but better farm equipment. Fruits and vegetables that can grow in different kinds of environments make it possible for city people to grow inside or rooftop gardens.

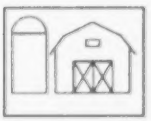


TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

Using Career Search Abstracts, find the occupations listed below. Select the two occupations that sound most appealing to you. On a separate sheet of notebook paper, list the two occupations you selected and tell why. Remember to use complete sentences, proper grammar, and correct spelling. Give the sheets to your instructor.

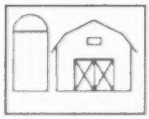
- Agricultural Engineer
- Agricultural Scientist
- Farm Equipment Mechanic
- Farm Worker
- Farmer/Farm Manager

DAY 8
ACTIVITIES



CAREER SEARCH ACTIVITY
INSTRUCTIONS

RELATED CAREERS



AGRICULTURAL ENGINEER

NATURE OF THE OCCUPATION

Agricultural engineers apply knowledge of engineering and of biological science to such agricultural problems as the production, processing and distribution of food and other agricultural products, and the management and conservation of energy, soil and water resources, power and machinery.

Duties may include but are not limited to the following:

- Designing machinery, equipment and systems to perform agricultural tasks better, faster and more economically
- Designing, developing and testing agricultural structures and controlled environments for plants and animals
- Designing and using special equipment to study particular problems, such as the effects of temperature, humidity and light on plants or animals
- Designing waste management programs for rural areas

OCCUPATIONAL SPECIALTIES

Agricultural Engineers (013.061-010) may work primarily in research and development, production, sales, management, teaching or consulting. They may specialize in equipment and machinery, structures and environment, soil and water engineering, food engineering, agricultural waste management, electric power and international agriculture.

Agricultural-Research Engineers (013.061-014) conduct research to develop agricultural machinery and equipment.

Agricultural Equipment Design Engineers (013.061-018) design agricultural machinery and equipment.

Agricultural Equipment Test Engineers (013.060-022) test agricultural machinery and equipment to ensure proper function and durability.

Agricultural Equipment Sales Engineers (013.151-010) sell agricultural equipment and machinery and provide technical services to clients.

Agricultural Engineering Technicians (013.161-010) prepare the original layouts and complete detailed drawings of agricultural machinery and equipment, such as farm machinery, irrigation, power and electrification systems, soil and water conservation equipment and agricultural harvesting and processing equipment.

WORKING CONDITIONS

Most agricultural engineers work primarily in modern offices or laboratories. They may spend some time outdoors, testing new equipment and processes or studying farm operations. They may also spend time in food processing plants to oversee the installation and start-up operations of machinery or equipment.

The normal work week for most agricultural engineers is 5 days, 40 hours. The number of hours may vary with the type of work done. Overtime may be necessary when deadlines must be met. Some travel is necessary to attend meetings, conduct field tests or visit food processing plants, farms or equipment manufacturing plants.

Tools, equipment and materials used may include:

- Farm tractors
- Test equipment
- Harvesting and handling equipment
- Specifications
- Drafting tools
- Computer-aided design systems
- Computers
- Calculators
- Blueprints

You should like:

- Activities dealing with things and objects
- Activities of a scientific and technical nature
- Activities that involve the use of machines, techniques and processes
- Activities that require creative thinking to solve problems
- Communication of ideas and information

You should be able to:

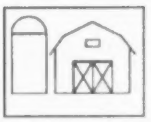
- Use reason and logic in a clear and organized manner
- Understand the meanings and relationships of words and use language effectively
- Perform mathematical operations quickly and accurately
- Look at flat drawings or pictures and understand how they would look as solid objects with height, width and depth
- Make decisions based on measurable data
- Work within precise limits or standards of accuracy
- Perform a variety of duties that may change often

Physically you must:

- Use your arms, hands and fingers fully
- See well, either naturally or with correction

Special Requirements:

In some states, agricultural engineers must be licensed by a state board of professional engineers. Licensure may entail a bachelor's degree in an approved engineering program, a stipulated period of additional experience and passing a written exam. A bachelor's degree in agricultural engineering from an accredited engineering program is some



AGRICULTURAL ENGINEER

times the minimum requirement for entry level positions.

Opportunities for Experience:

Summer or part-time jobs with an agricultural equipment manufacturing company, working on a farm and serving in the Peace Corps are ways to gain experience.

High school students interested in engineering careers may join the Junior Engineering Technical Society (JETS) or participate in the Minority Introduction to Engineering (MITE) program. Work experience may be obtained through an agricultural engineering internship or an experience-based learning program.

EARNINGS AND ADVANCEMENT

Earnings depend on personal ability, education and experience; the type, size and location of the employer and the duties and responsibilities of the position. Since many jobs are in rural communities where the cost of living tends to be lower, agricultural engineers generally receive lower salaries than other engineers.

Earnings:

The average annual salary offer to college graduates with a Bachelor's degree in agricultural engineering was $30,429 in 1994. The average salary for all engineers in the federal government was $54,206 in 1994.

Some engineers supplement their income through bonuses and consulting fees. The average daily consulting fee was $1,166 in 1994. Salaries in the North Central area of the country where the majority of agricultural engineers are employed tend to be lower.

Fringe Benefits:

Almost all agricultural engineers receive paid vacations and holidays, life, medical, and hospitalization insurance, sick leave, pension plans and educational reimbursement plans. Some also receive dental and optical benefits as well as savings and stock investment plans.

Career ladder for this occupation may look like this:

- Chief Engineering Supervisor
- Agricultural Engineer
- Engineering Trainee

Agricultural engineers teaching in colleges and universities follow a career pattern typical of other faculty members.

EMPLOYMENT AND OUTLOOK

There were approximately 29,000 agricultural scientists employed nationally in 1992. Employment is expected to grow as fast as the average for all occupations through 2005. Growth is expected because of an increasing demand for agricultural products, emphasis on mechanization of agricultural operations, concern for resource conservation and the use of agricultural products as energy sources.

Currently there is a shortage of people with doctorates in agricultural engineering to teach post-secondary level students.

Oklahoma Employment and Outlook

In Oklahoma, agricultural engineers are projected to have 4 job openings annually until the year 2000. These job openings represent new jobs and replacements caused by leaving the occupation, promotions, retirements, etc. In 1990, agricultural engineers held 87 jobs in Oklahoma. They are expected to hold 105 jobs by the year 2000.

Levels of education and training usually needed for this occupation:

- College - bachelor's degree
- College - master's degree

Levels of education and training also available for this occupation:

- College - Ph.D. or professional degree

School subjects helpful in preparing for this occupation:

- Agricultural Mechanics
- Agricultural Production
- Production/Management
- College Preparatory
- Agricultural Resources
- Mechanical Drawing
- Blueprint Reading

MORE SOURCES OF INFORMATION

- National Action Council for Minorities in Engineering (NACME)
  3 West 35th St.
  New York, NY 10001-2281

- Society of Women Engineers (SWE)
  120 Wall Street, 11th Floor
  New York, NY 10017

- National Society of Black Engineers (NSBE)
  1454 Duke St., P.O. Box 25588
  Alexandria, VA 22313-5588

- Junior Engineering Technological Society (JETS)
  1420 King Street, Suite 405
  Alexandria, VA 22314-2715

- American Society of Agricultural Engineers
  2950 Niles Road
  St. Joseph, MI 49085-9659

AGRICULTURAL SCIENTIST

NATURE OF THE OCCUPATION

Agricultural scientists may be grouped into two major categories: those concerned with soil and things grown in soil and those concerned with animals and animal products. Because agricultural science is closely related to biological science, agricultural scientists use the principles of biology and other sciences to solve problems in agriculture.

Duties may include but are not limited to the following:

- Studying crop production to discover the best methods of planting and harvesting
- Determining feed requirements of animals
- Controlling breeding practices to improve strains of animals
- Managing marketing or production operations in companies that produce food products or agricultural supplies and machinery

OCCUPATIONAL SPECIALTIES

Agronomists (040.061-010) study how field crops such as corn, wheat and cotton grow. They improve crop quality and yield by developing new growth methods and by controlling diseases, pests and weeds.

Animal Scientists (040.061-014) conduct research on the selection, breeding, feeding, management and health of domestic farm animals.

Dairy Scientists (040.061-018) along with **Poultry Scientists** (040.061-042) conduct research on the selection, breeding, feeding and management of dairy cattle and poultry.

Food technologists (041.081-010) study the chemical, physical and biological nature of food to learn how to safely process, preserve, package, distribute and store it.

Horticulturists (040.061-038) work with fruit, vegetable, greenhouse and nursery crops and ornamental plants. They seek improved quality, yield and methods to resist crop diseases.

Soil Scientists (040.061-058) study soil characteristics, map soil types and determine the best types of crops for each soil. They study the chemical and physical characteristics of soils and their responses to fertilizers, tillage practices and crop rotation.

Animal Breeders (041.061-014) along with **Plant Breeders** (041.061-082) breed animals and plants to develop and improve their potential.

Entomologists (041.061-046) study insects and their relationship to plant and animal life.

WORKING CONDITIONS

Working conditions vary widely depending on the work performed. Agricultural scientists associated with business firms and government agencies generally work a 40-hour week in offices and laboratories. Some agricultural scientists spend much time outdoors conducting research on farms or agricultural research stations. Agricultural scientists who manage farms may find it necessary to work long hours.

Agricultural scientists may belong to many societies or associations such as the American Society of Agronomy and the National Association of Animal Breeders. Agricultural scientists who belong to associations must pay membership fees.

Tools, equipment and materials used may include:

- Laboratory equipment
- Computers
- Incubators
- Combines
- Microscopes
- Tractors
- X-ray equipment
- Farm machinery

You should like:

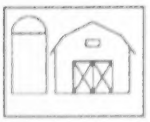
- Activities of a scientific and technical nature
- Using scientific information for practical problem solving
- Doing research
- Working in laboratories and/ or outdoors

You should be able to:

- Be precise in keeping research records
- Communicate clearly, orally and in writing
- Work independently or as part of a team

Physically you must:

- Have good vision, either naturally or with correction
- Reach, grasp and hold
- Operate farm equipment



AGRICULTURAL SCIENTIST

- Be able to deal with all types of weather conditions
- Be able to work with livestock

Special Requirements:

At least a bachelor's degree is required in this field. Advanced degrees are usually required for college and university teaching.

Opportunities for Experience:

Some idea of the working conditions and the problems facing farmers can be obtained through summer or part-time work on farms as well as internships.

Methods for Entry:

To find a job as an agricultural scientist, apply directly to civil service personnel offices, business concerns or colleges and universities.

EARNINGS AND ADVANCEMENT

Earnings and advancement of agricultural scientists depend upon such factors as education, professional experience, individual ability and type of employment.

Earnings:

The average salary for agricultural scientists with a Bachelor's degree in agricultural science was $25,335 in 1994. Agricultural scientists with a Bachelor's degree in plant science were offered $30,815 per year. Experienced agricultural scientists working as agronomists earned averages of up to $37,907.

Agricultural scientists employed by the federal government in 1994 earned salaries ranging from $43,059 to $54,324.

Oklahoma Salary

Region	Range
Central	11.00-15.50
Northeast	--
Northwest	--
Southwest	--
Southeast	13.00-23.00

Fringe Benefits:

Most salaried agricultural scientists receive paid vacations and holidays, life, accident, disability, and hospitalization insurance, retirement plans and sick pay. These benefits are usually paid, at least in part, by employers.

Career ladder for this occupation may look like this:

- Supervisor of Research Program
- Senior Agricultural Scientist
- Junior or Assistant Agricultural Scientist

Agricultural scientists who operate successful farms may consider increased earnings as advancement. Agricultural scientists associated with colleges and universities may follow the typical pattern of advancement.

EMPLOYMENT AND OUTLOOK

There were approximately 29,000 agricultural scientists employed nationally in 1992. Employment is expected to grow at an average rate through the year 2005. Animal and plant scientists with a background in molecular biology, microbiology, genetics or biotechnology, soil science or food technology will probably have the best opportunities.

Oklahoma Employment and Outlook

In Oklahoma, agricultural scientists are projected to have 13 job openings annually until the year 2000. These job openings represent new jobs and replacements caused by leaving the occupation, promotions, retirements, etc. In 1990, agricultural scientists held 329 jobs in Oklahoma. They are expected to hold 358 jobs by the year 2000. This is considered a slow growth rate.

Levels of education and training usually needed for this occupation:

- College - bachelor's degree

Levels of education and training also available for this occupation:

- College - master's degree
- College - Ph.D. or professional degree

School subjects helpful in preparing for this occupation:

- Agricultural Mechanics
- Agricultural Production/ Management
- Agricultural Resources
- Cooperative Education - Agriculture
- Forestry
- Landscaping
- College Preparatory
- English
- Algebra
- Biology
- Chemistry
- Physics

MORE SOURCES OF INFORMATION

- American Society for Horticultural Science
  113 South West St., Suite 400
  Alexandria, VA 22314

- Soil and Water Conservation Society
  7515 Northeast Ankeny Road
  Ankeny, IA 50021

- Career Development & Placement
  American Society of Agronomy
  677 South Segoe Road
  Madison, WI 53711

- Attn: Barbie Whitt, Secretary
  National Association of Animal Breeders
  Box 1033
  401 Bernadette Dr.
  Columbia, MO 65205

BEST COPY AVAILABLE

FARM EQUIPMENT MECHANIC

NATURE OF THE OCCUPATION

A farm equipment mechanic maintains, repairs and overhauls farm equipment used to plant, cultivate and harvest crops. In addition, some mechanics who work for dealers and equipment wholesalers assemble new implements and machinery.

Duties may include but are not limited to the following:

- Doing preventive maintenance
- Assembling implements for dealers
- Installing or repairing wiring or motors on electrically driven machinery
- Repairing damaged sheet metal
- Diagnosing and repairing diesel and gasoline tractors and other equipment
- Welding defective body or frame parts
- Traveling to farms to make repairs on equipment
- Repairing air-conditioning units on cabs of combines and tractors

OCCUPATIONAL SPECIALTIES

Milking System Installers (809.381-018) install and service automatic milking systems in barns and milkhouses.

WORKING CONDITIONS

Farm equipment mechanics may work in service departments of farm equipment manufacturers or dealerships, independent repair shops, repair shops on large farms or in fields when machinery cannot be brought to the shop. Some farm equipment mechanics are self-employed.

Working hours for farm equipment mechanics vary from 44 hours a week in the slow season to 60 or more hours per week in the busy season. Most mechanics stay busy year round by readying equipment ahead of time for the busy months. Because of the shortage of qualified farm equipment mechanics, employers attempt to keep experienced workers busy all year.

Some employers supply hand tools and all shop equipment. Other employers require mechanics to own and maintain their own hand tools, which can cost from $225 to several thousand dollars.

Tools, equipment and materials used may include:

- Hammers
- Jacks
- Wrenches
- Micrometers
- Pliers
- Dynamometers
- Welders
- Power metal cutters
- Hoists
- Compression testers
- Calipers
- Blueprints and manuals
- Torque wrenches

You should like:

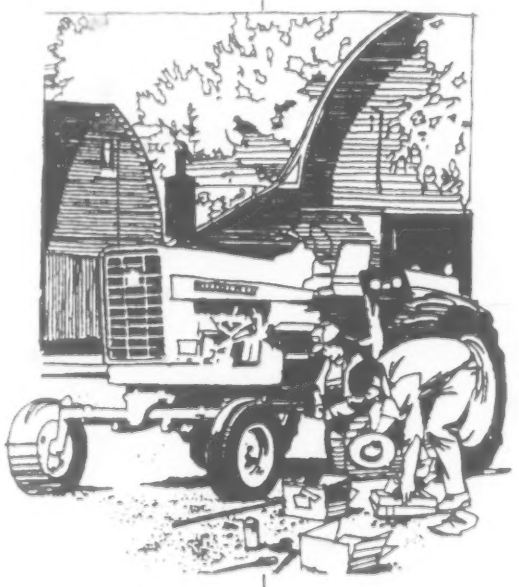
- Working with machines and equipment
- Working outdoors
- Seeing the physical results of your work

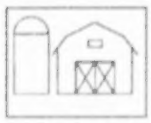
You should be able to:

- Read and follow instructions, manuals and blueprints
- Understand how equipment works
- Use and understand complex testing equipment
- Use hand and power tools
- Work independently
- Travel within a limited area
- Work under pressure

Physically you must:

- Lift heavy tools and parts
- Maintain good health and alertness
- Have normal vision and hearing, either naturally or with correction
- Stretch, reach, bend and stoop
- Have good use of your hands





FARM EQUIPMENT MECHANIC

Special Requirements:

Manufacturers may request that a farm equipment mechanic pass a written and practical test for mechanical work. With the development of more complex farm equipment, more employers prefer to hire trainee farm equipment mechanics who have completed a 1- or 2-year training program in agricultural or diesel mechanics at a vocational or technical school or community or junior college. Employers stress previous experience or training in diesel and gasoline engines.

Opportunities for Experience:

Living or working on a farm after school or on weekends provides experience with farm machinery. Experience is also available through apprenticeship or co-op programs and Future Farmers of America (FFA) at high schools, 4-H clubs, vocational centers and community colleges.

EARNINGS AND ADVANCEMENT

The pay scale for farm equipment mechanics depends on the size and nature of the employer's business, equipment supplied, duties and location.

Earnings:

Farm equipment mechanics earned an average annual salary of $30,997. Median hourly earnings in 1994 were $9.40. The middle 50 percent earned between $7.73 and $12.21 an hour. Most farm equipment mechanics had the opportunity to earn overtime wages during planting and harvesting seasons, for which they generally were paid time and one-half.

Oklahoma Salary:

Region	Range
Central	6.50-9.00
Northeast	--
Northwest	8.00-15.50
Southwest	7.25-13.00
Southeast	--

Fringe Benefits:

Fringe benefits may include uniforms, paid sick leave, retirement plans, paid vacation and holidays, and health and life insurance. Repairers employed on large private farms may receive free or low-cost housing.

Career ladder for this occupation may look like this:

- Service Representative for Farm Equipment Manufacturer
- Manager of a Farm Equipment Dealership
- Repair Shop Owner
- Service Manager
- Shop Supervisor
- Farm Implement Repairer
- Apprentice/Trainee

Small farms or service shops cannot offer much advancement other than increased wages. With larger farms or shops, promotion is related to knowledge of the job.

EMPLOYMENT AND OUTLOOK

There were approximately 47,000 farm equipment mechanics employed nationally in 1992. Employment of farm equipment mechanics is expected to increase more slowly than the average for all occupations through the year 2005. The increasing complexity of equipment will force more farmers to rely on mechanics for service and repairs, but the continued consolidation of farmland will allow equipment to be used more efficiently. Most job openings will arise from the need to replace experienced mechanics who retire. Opportunities should be good for persons who have completed formal training in farm equipment repair, such as diesel mechanics.

Oklahoma Employment and Outlook

In Oklahoma, farm equipment mechanics are projected to have 25 job openings annually until the year 2000. These job openings represent mostly replacements caused by leaving the occupation, promotions, retirements, etc. rather than new job growth. In 1990, farm equipment mechanics held 735 jobs in Oklahoma. They are expected to hold 782 jobs by the year 2000. This is considered a slow growth rate.

Levels of education and training usually needed for this occupation:

- On-the-job training
- High school diploma or G.E.D.
- High school diploma with vocational education
- Technical, junior or community college
- Apprenticeship

School subjects helpful in preparing for this occupation:

- Agricultural Mechanics
- Auto Mechanics
- Cooperative Education - Trade and Industrial
- Machine Shop
- Shop Math
- Metal Shop
- Welding
- Shop Mechanics

MORE SOURCES OF INFORMATION

- North American Equipment Dealers Association
  10877 Watson Road
  St. Louis, MO 63127-1081

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FARM WORKER

NATURE OF THE OCCUPATION

Farm workers perform various agricultural duties to produce food for human or animal consumption and/or raise and look after the welfare of animals.

Duties may include but are not limited to the following:

- Preparing the soil for planting
- Planting seeds or seedlings
- Spraying crops with insecticides and fungicides
- Cultivating, irrigating and harvesting crops
- Tending livestock and poultry
- Milking cows
- Operating, repairing and maintaining farm machinery and equipment
- Cleaning and repairing farm buildings, fences and other structures
- Hauling livestock and products to market
- Harvesting crops

OCCUPATIONAL SPECIALTIES

Diversified Crops Farmworkers (407.663-010) drive and operate farm machines to grow and harvest a combination of diverse crops, such as grain, fruit and vegetables.

General Farmworkers (421.683-010) perform a variety of animal and crop raising duties.

Dairy Helpers (529.686-026) perform a variety of tasks including keeping the dairy clean, setting up equipment, inspecting dairy products, and storing and loading products.

Machine Milkers (410.685-010) tend machines that milk dairy cows.

Stable Attendants (410.674-022) care for horses and mules to protect their health and improve their appearance.

WORKING CONDITIONS

Farm workers work outdoors most of the time and in all types of weather. Farm work can be extremely hazardous. Accidents may be caused by tractor and machinery problems, carelessly handled tools, barbed wire, mechanized equipment and injuries from lifting heavy equipment. Pesticides and disease transmitted by farm animals may also present difficulties to workers.

Some jobs are seasonal. Many of the workers employed in seasonal jobs are migrant workers whose work may be of very short duration.

Farm workers often work long hours. During the harvest season or other peak working periods, a farm worker may work up to 80 hours per week.

Tools, equipment and materials used may include:

- Animal pens, cages, coops
- Harrowing machines
- Hay balers
- Automated feeding equipment
- Mechanical barn cleaners
- Mechanical harvesters
- Combines
- Mowing machines
- Conveyors
- Plows
- Corn pickers
- Tractors
- Crop sprayers
- Forklift trucks

You should like:

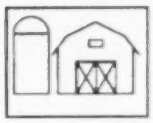
- Working outdoors
- Working with machines and objects

You should be able to:

- Follow directions accurately and precisely

Physically you must:

- Bend, crouch and kneel
- Work easily with your hands and fingers
- Lift up to 100 pounds



FARM WORKER

Opportunities for Experience:

Several ways to explore or gain experience in this field include summer work on farms and part-time work or participation in co-op programs usually available through a high school or area skill center.

Methods for Entry:

To get a job as a farm worker, apply directly to the owner or manager of a farm or contact farm bureaus, county agricultural agents and high school placement offices. Newspaper want ads also list job openings.

EARNINGS AND ADVANCEMENT

As a group, farm workers are among the lowest paid workers in the nation. Wages vary depending on the type of work performed, length of employment and experience. Farm workers may be paid by the hour or by the piece.

Earnings:

In 1994, farm workers earned an average weekly rate of $261, for an annual salary of $13,622. Beginning workers earned about $9,828 per year. Supervisors and tractor drivers earned more, averaging $480 weekly, for an annual salary of $24,945. Farm workers generally work longer hours during peak seasons and are compensated accordingly.

Oklahoma Salary:

Region	Range
Central	7.25-9.00
Northeast	5.75-9.00
Northwest	5.75-8.00
Southwest	under-5.75
Southeast	under-7.25

Fringe Benefits:

Fringe benefits for full-time, year-round farm workers may include sick leave, retirement, paid vacations and holidays and health and life insurance. In addition, farm workers may receive free housing, free farm products, and the use of a car or truck.

Career ladder for this occupation may look like this:

- Farm Owner
- Farm Manager
- Farm Worker
- Seasonal Worker
- Helper

Advancement can be achieved by combining on-the-job farm experience with vocational agricultural courses.

EMPLOYMENT AND OUTLOOK

Nationally, about 849,000 farm workers were employed in 1992. Employment is expected to decline through the year 2005, due to increasing farm mechanization. Job openings will occur to replace farm workers who retire or leave their jobs for other reasons. There is a trend toward hiring higher skilled workers as machinery becomes more complex.

Oklahoma Employment and Outlook

In Oklahoma, farm workers are projected to have 880 job openings annually until the year 2000. However, almost all of these job openings represent replacements caused by leaving the occupation, promotions, retirements, etc. rather than new job growth. In 1990, farm workers held 30,644 jobs in Oklahoma. They are expected to hold 30,743 jobs by the year 2000. This is considered a slow growth rate.

Levels of education and training usually needed for this occupation:

- Less than high school diploma
- On-the-job training
- High school diploma with vocational education

School subjects helpful in preparing for this occupation:

- Agricultural Mechanics
- Auto Mechanics
- Cooperative Education - Trade and Industrial

MORE SOURCES OF INFORMATION

- United Farm Workers of America
  P.O. Box 62 La Paz
  Keene, CA 93531

FARMER/FARM MANAGER

NATURE OF THE OCCUPATION

Farmers (operators) and farm managers are concerned with producing crops, raising, tending and marketing farm animals and managing farm workers. Their specific tasks are determined by the type of farm they operate.

Duties may include but are not limited to the following:

- Planning crops to be planted or livestock to be raised
- Preparing soil for planting, planting seeds
- Cultivating and irrigating crops
- Spraying crops with insecticides and fungicides
- Harvesting and marketing produce
- Tending and marketing livestock and poultry

OCCUPATIONAL SPECIALTIES

Livestock Ranchers (410.161-018) breed and raise livestock such as beef cattle, dairy cattle, goats, horses, sheep and swine to sell meat, dairy products, wool and hair or to breed and show.

Fur Farmers (410.161-014) feed and raise mink, fox, chinchilla, rabbits and other fur-bearing animals for sale on the fur market.

Poultry Farmers (411.161-018) raise chickens, turkeys or other fowl for meat or egg production.

Vegetable Farmers (402.161-010) plan and plant vegetables according to weather, type of soil and size and location of the farm.

Tree Fruit-and-Nut Crop Farmers (403.161-010) plant and cultivate fruit producing trees.

Nursery Managers (180.167-042) supervise plant nurseries that produce plants for sale to wholesale or retail customers.

Farm General Managers (180.167-018) operate farms for corporations, cooperatives or other owners.

Fish Farmers (446.161-010) spawn and raise fish for commercial purposes.

Shellfish Growers (446.161-014) cultivate and harvest beds of shellfish, such as clams and oysters.

Horse Trainers (419.244-010) train horses for riding or harness.

WORKING CONDITIONS

Farmers and farm managers may work alone or with others and may be responsible for running the farm. Farmers usually work outdoors, while farm managers spend considerable time indoors analyzing or preparing reports, updating records and keeping abreast of new developments in agriculture.

Farming is one of the most hazardous occupations in the nation because of falls, tractor and farm machinery accidents and strains from lifting heavy objects.

Crop farmers usually work long hours during the growing and harvesting seasons; while livestock farmers usually work a 7-day, 60- to 80-hour week year round. An 8-hour day and year-round employment are fairly typical for farm managers. Because most types of farming is seasonal, many farmers and managers have second jobs off the farm for 5 to 6 months of the year.

Farmers and farm managers may join such organizations as the National Farmers Organization, the National Grange, farm bureaus and cooperatives. Members usually pay dues.

Tools, equipment and materials used may include:

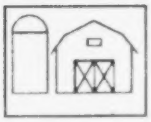
- Tractors
- Conveyors
- Combines
- Corn pickers
- Cultivators
- Mowing machines
- Mechanical harvesters
- Incubators
- Hoes and shovels
- Sickles

You should like:

- Activities related to machines, processes or techniques
- Activities involving business contact with people

You should be able to:

- Perform a variety of duties that may change often
- Direct, control and plan farm activities
- Rate information by using personal judgment and measurable standards
- Make minor repairs to machinery and equipment
- Use managerial skills to organize and operate a business
- Work with tools of all kinds
- Do some basic accounting and bookkeeping
- Use computers for record-keeping and business analysis



FARMER/FARM MANAGER

Physically you must:
- See well, either naturally or with correction
- Talk and hear
- Have good manual dexterity
- Bend, crouch and kneel
- Climb and maintain body balance
- Lift objects weighing up to 100 pounds

Opportunities for Experience:

Summer and part-time employment at farms, co-op programs, membership in 4-H clubs and Future Farmers of America (FFA) organizations may provide useful experience in this occupation.

EARNINGS AND ADVANCEMENT

Earnings depend upon the size of farm, type of crop grown or animal raised, weather during the growing season, market prices, cost of materials, labor, overhead and management ability.

Earnings:

Farmers' incomes vary greatly from year to year, since prices of farm products fluctuate depending upon weather conditions that influence the amount and quality of farm output. Nationally, farm managers with 12 years' experience earned an average annual salary of $28,213 in 1994. Income depends on the size and type of farm. Nationwide, first-year average income was $20,209 per year. In addition to salaries, farm managers may receive production incentive pay.

Oklahoma Salary:

Region	Range
Central	7.25-9.00
Northeast	5.75-9.00
Northwest	5.75-8.00
Southwest	--
Southeast	under-7.25

Fringe Benefits:

Depending on the employer, farm managers may receive paid vacations and holidays, sick leave, health and life insurance and retirement plans. These benefits are usually paid, at least in part, by employers. Farmers/farm managers may also receive free housing and farm products, and are furnished transportation.

Career ladder for this occupation may look like this:

Farmers/farm managers usually advance through the purchase of farms, increased income from expansion of farmland or investment in labor-savings machinery.

EMPLOYMENT AND OUTLOOK

There were approximately 1,218,000 farmers and farm managers employed nationally in 1992. Employment of farm operators and managers combined is expected to continue to decline through the year 2005, but at a slower rate than in the past. Generally, openings will be to replace those who retire or leave the occupation for economic or other reasons.

Oklahoma Employment and Outlook

In Oklahoma, farm managers are projected to have 247 job openings annually until the year 2000. These job openings represent new job growth and replacements caused by leaving the occupation, promotions, retirements, etc. In 1990, farm managers held 5,897 jobs in Oklahoma. They are expected to hold 7,267 jobs by the year 2000. This is considered an average growth rate due to the relatively large number of farm managers employed in Oklahoma in 1990.

Levels of education and training usually needed for this occupation:
- On-the-job training
- High school diploma with vocational education
- Technical, junior or community college
- College - bachelor's degree

School subjects helpful in preparing for this occupation:
- Agricultural Mechanics
- Agricultural Production/Management
- Cooperative Education
- Agricultural Resources
- College Preparatory
- Agriculture
- Bookkeeping
- Forestry
- Biology
- Math
- Business
- Economics

MORE SOURCES OF INFORMATION

- ATTN/CRT
  National FFA Organization
  Box 15160
  5632 Mt. Vernon Memorial Hwy.
  Alexandria, VA 22309-0160

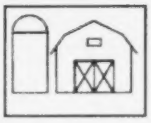
- Career Development & Placement Services
  American Society of Agronomy
  677 South Segoe Road
  Madison, WI 53711

- Public Policy Division
  Amer. Farm Bureau Federation
  255 Touhy Avenue
  Park Ridge, IL 60068

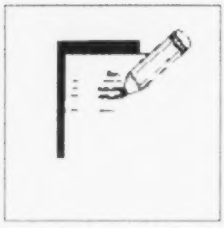
- National Agri-Marketing Assoc.
  12345 W. 95th Street, No. 204
  Shawnee Mission, KS 66215

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

DAY 8 ACTIVITIES



POSTTEST INSTRUCTIONS



You will need a computer scan sheet or card to record your answers to the following Posttest. Be sure to write your name, the title of the TLA, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 11–20 to record the answers to the Posttest. If your answers will be hand-scored, use a blank sheet of paper to record your answers and number your answers 11–20. Use rows 21–30 on the test card for the spelling test. If the word is spelled correctly, mark (a) on the computer score sheet or card. If the word is spelled incorrectly, mark (b) on the test card. Be sure to use a #2 pencil and make your marks dark. If your answers will be hand scored, use a blank sheet of paper to record your answers and number your answers 21–30.

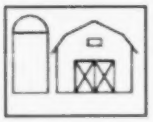
Get Posttest Questions from your instructor.

When you finish the Posttest, return the test form and the computer scan card or notebook paper to your instructor.

If you complete Day 8 Activities with time left over, you may complete a Skunk Works activity.

TECHNOLOGY EDUCATION
AGRICULTURE EDUCATION

SKUNK WORKS



BACKGROUND

The term Skunk Works comes from an engineering division of the 3M Company. In the late 1960s, a group of engineers at 3M wanted to design a new product, but the managers of the company would not give them the money for research. So they decided to design the product anyway, then try to convince the company to market it. Whenever the engineers could grab a few extra minutes from their regular assignments, they worked on the new product. In early 1969 they presented it to the marketing division of 3M, and the company has been selling it every since. The product: Velcro fasteners.

SKUNK WORKS CHALLENGE

For this Skunk Works activity, you will be evaluating or improving the farm you created on Days 6 and 7. If you wish, and if time allows, you may create a new farm to evaluate. Look at your farm, reviewing the decisions you made about location, rainfall, wind, climate, crops, etc. Make a list of these decisions, explaining why you decided as you did. Think about each decision. Did you have other choices? How would a different decision change your farm? Try some different choices to see the effects. Try to make your farm even more successful.

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